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THE  
RAY SOCIETY

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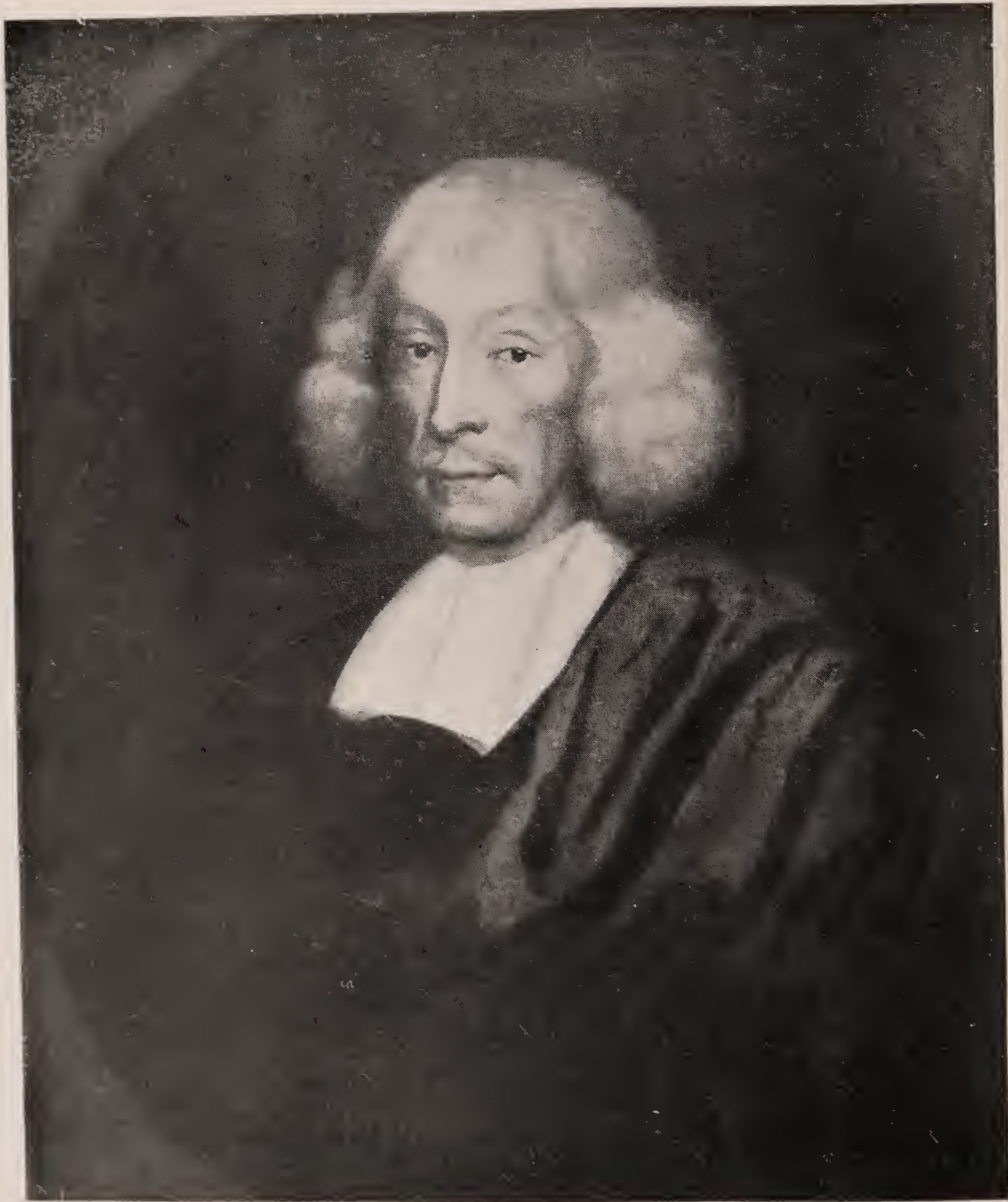
L O N D O N

MCMXXVIII

*Made and printed in Great Britain.*







JOHN RAY.

*(From the portrait in the National Portrait Gallery.)*



FURTHER CORRESPONDENCE  
OF  
JOHN RAY

EDITED BY  
ROBERT W. T. GUNTHER, M.A., Hon.LL.D.  
VICE-PRESIDENT OF THE LINNEAN SOCIETY

*WITH TWO PORTRAITS  
ALSO TWO HALF-TONE PLATES AND SIX TEXT-FIGURES*

LONDON  
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## PREFACE.

THE Ray Society has already published two books in commemoration of the great naturalist whose name it honours and preserves. The first volume, entitled *Memorials of John Ray*, was issued in 1846 under the editorship of the Secretary of the Ray Society, Dr. Edwin Lankester. It comprised the original Life of Ray by Dr. William Derham, the biographical notices by Sir J. E. Smith in Rees's *Cyclopædia* and by Cuvier and Du Petit Thouars in the *Biographie Universelle*, together with Ray's *Itineraries* and his Essay on "The Number of Plants." Two years later a second and larger volume, *The Correspondence of John Ray*, was prepared by the same editor.

It might be supposed that in these two volumes would have been brought together all the more important materials relating to our great countryman, and that nothing of sufficient novelty would be left with which to commemorate the tercentenary of his birth. But so many of Ray's original letters have been omitted by chance, and so many passages in his published letters have been eliminated by design, that there are more than sufficient materials to add yet a third volume, preparatory to that Life for which the world has waited for so many years.

This book, then, is the outcome of a rediscovery in the Bodleian Library of a number of letters of John Ray which have not only never been printed *in extenso*, but which form a necessary supplement to the volume of *The Correspondence*. For, whereas some four-fifths of certain parts of that volume are devoted almost exclusively to the letters of his correspondents to him, the Bodleian collection consists of the more important half of the correspondence, namely of Ray's own letters to

his two Oxford correspondents, John Aubrey, the antiquary, and Edward Lhwyd, the second keeper of the Ashmolean Museum which was then a museum of natural history. Before their transference to the Bodleian Library the greater number of these letters had been deposited at the desire of their donors in the Library of the Ashmolean Museum, where in a room, now occupied by the present editor in his official capacity of Curator of the Lewis Evans Collection, they were kept in presses with the Ashmolean manuscripts. How Dr. Lankester came to miss them is a mystery, because they must always have been accessible to any diligent inquirer who was persistent enough to overcome the lethargy which from time to time afflicted the keepers of the Ashmolean Museum. Their interest seems first to have been made known by Mr. G. S. Boulger in the *Essex Review* for 1916, but doubtless many searchers, like the present editor, may have independently come across the entries to them in the Bodleian catalogues. The original series consists of fourteen letters (MS. Aubrey 13) from Ray to Aubrey, and of fifteen letters (MS. Ashmole 1817*a*) from Ray to Lhwyd, written between 1690 and 1694.

To these were added in 1890 a third series of twenty-six letters also from Ray to Lhwyd, written between 1689 and 1703, which had been in the possession of Sir Joseph Paxton, and after being offered, appropriately enough, to the then Curator of the Ashmolean Museum, Sir Arthur Evans, and refused by him, were purchased by the Bodleian Library for £15 from Sir Joseph's daughter, Mrs. E. Dalton, of Matlock. Though they belong to the same series as the letters catalogued as MS. *Ashmole* 1817*a*, these are marked MS. *English History* c. 11. They reached the Bodleian when Mr. Nicholson was Librarian, and many have had the writing obscured by opaque yellow paper pasted over the surface.

An inquiry at the Royal Society resulted in the finding of a series of nine letters in Ray's holograph



addressed to the secretaries, Henry Oldenburg, Waller and Tancred Robinson between 1670 and 1693. The contents of all were probably reported at the contemporary meetings of the Society, and some were published in the *Philosophical Transactions*; others, however, have never been printed, and none are noticed in Dr. Lankester's volume of *Correspondence*. To these, too, are added Ray's early letters to his pupil Peter Courthope, of Danny Park.

In the compilation of his volume of Ray's *Correspondence*, Dr. Lankester appears merely to have reprinted the collection of letters edited in 1718 by Dr. William Derham under the title of *Philosophical Letters*, with many omissions, and to have added thereto the long correspondence between Ray and Sir Hans Sloane that is now scattered through some eight bulky volumes of *Sloane MSS.* in the British Museum, numbered 4036, 4037, 4039, 4060, 4062, 4063, 4064, 4067. The Derham letters are much curtailed, and often stripped of points of human interest, but the Sloane letters, though modernized as regards spelling, have been accurately copied, possibly under the supervision of the Librarian, Sir Henry Ellis, and are fully published, even with the addresses on the covers.

By good fortune many of the original letters, which, with considerable excisions, were included among the *Philosophical Letters* of 1718, are again available for study. Their history has been traced by Professor Boulger. They passed from Derham's possession to that of his wife's nephew, George Scott, of Woolston Hall, who published the *Select Remains of John Ray* in 1760. After Scott's death in 1780 they passed into the possession of the Prideaux family, and were discovered about 1880 by C. G. Prideaux-Brune, Esq., among the papers of Lady Prideaux, at Neatherton, in Devonshire. In 1884 Mr. Prideaux-Brune gave them to J. D. Enys, Esq., by whom they were sold to the Trustees of the British Museum, and they are now in the Botanical Department. By the courtesy of the

present Keeper, Dr. Rendle, we are able to print those personal details, now of enhanced interest, which we agree with Professor Boulger in thinking that Derham, doubtless from considerations of space, intentionally omitted. The work of finding the missing passages was very greatly assisted by a reprehensible practice of their first editor, who freely marked the original letters with red pencil to show the printer what he wished to reproduce and what he desired to be left out.

With these Derham manuscripts are also several sheets of brief abstracts of letters which were consulted by him, but which appear to have been lost since. By their number they show what an energetic letter-writer Ray was; indeed his extant letters appear to be but a small fraction of those originally written by him. Unfortunately the writing of the abstracts is both bad and contracted, so that our transcript has many omissions and may be faulty. Still, the extracts are dated, and doubtless preserve the most important points in the original letters.

On the other hand, Dr. Lankester's arrangement of the letters leaves much to be desired, for the editor does not appear to have realized the confusion necessarily resulting from the placing of letters dated January, February or March *before* April instead of *after* December of the same year before the introduction of the New Style. This may have been the reason why it was found "difficult to assign any particular period" to certain undated letters which are printed at the end of the volume of 1848, but concerning the dating of which there does not appear to be any very great inherent difficulty. One of these letters is printed twice over on pages 194 and 463. His index is also a very partial one, being fairly complete for the names of plants for the first half of the book and again for the last pages, but with large gaps elsewhere. Names of persons and places are usually omitted. This index is repeated and extended in the present volume.

The time for a final biography of the great East



Anglian savant can, however, hardly be said to have come, for there is a rumour of yet other materials still unpublished, and at the present moment inaccessible.

As to the great debt that naturalists owe to John Ray there can be no question. It has been acknowledged in all ages. In his lifetime his contemporary Plukenet extolled his great *Historia Plantarum* as "the best medium to reach Heaven, better than ye Divinity of ye Schools." A century later Horace de Saussure considered him "le naturaliste le plus universel que l'Angleterre ait produit," and but a few weeks ago his outstanding and varied genius has been the subject of an eloquent *éloge* by a Swiss naturalist, Professor Strohl, of Zurich.

Among those to whom it is our pleasant duty to return thanks for permission to copy and print letters are the President and Council of the Royal Society, the Trustees of the British Museum and the Librarian of the Bodleian Library. My friend Mr. G. U. Powell, Fellow of St. John's College, made a special journey to London to settle doubtful readings in some of Ray's Latin letters to Martin Lister; Dr. G. C. Druce has helped with the modern equivalents of many of Ray's botanical names; and Misses Parker and Mold have taken pains with the difficult task of transcribing handwriting which, though apparently clear, is not by any means easy to interpret. Their work has saved me much time and eyesight.

The plates have been printed from blocks which have been lent by the Honorary Secretary of the Essex Field Club, Mr. Percy Thompson.

We gladly take this opportunity of repeating our thanks to the publishers of *British Birds* for the use of the figures on p. 3, to Dr. W. T. Calman for reading the proofs and for much other help, and especially to the President of the Ray Society, Professor W. C. McIntosh, for a large donation towards the cost of printing.

R. T. GUNTHER.





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*[The lost letters mentioned on p. 285 et seq. are not included in this table.]*

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1659. Feb. 25	2. F. Willughby .	—	1	—
1660. Sept. 26	3. Courthope .	—	—	17
1661. June 11	4. Courthope .	—	—	18
n.d.	5. Courthope .	—	—	19
„ [July]	6. Courthope .	—	—	20
Sept. 14	7. Willughby .	—	3	—
n.d.	8. Willughby .	—	4	—
Oct. 14	9. Courthope .	—	—	22
n.d.	10. Courthope .	—	—	24
„	11. Courthope .	—	—	25
„	12. Courthope .	—	—	26
Nov. 26	13. Courthope .	—	—	26
c. 1662.	—	Willughby	5	—
1662. April 28	14. Courthope .	—	—	27
n.d. [May]	15. Courthope .	—	—	28
Aug. 28	16. Courthope .	—	—	29
Sept. 4	17. Courthope .	—	—	32
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„	—	Willughby	—	—
1663. Nov. 28	—	Corneli	6	—
Dec. 18	—	M. Lister	36	—
n.d.	—	Willughby	7	—
1666. Mar. 13	—	Barnham	9	—
„ 24	—	Lister	11	—
1667. June 18	20. Lister	—	13	111
„ 25	—	Lister	15	—
Oct. 1	21. Lister	—	17	113
„ 12	22. Lister	—	19	116
Nov. 23	23. Lister	—	20	116
Dec. 13	—	P. Skippon	22	—
n.d.	—	Skippon	23	—
Jan. 24	—	Skippon	23	—
Feb. 21	—	Skippon	—	—



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„ 27	65. Robinson	—	134	139
Sept. 10	—	Robinson	135	—
1684. April 18	—	Robinson	141	—
June 4	—	Robinson	143	—
„ 16	66. Robinson	—	145	140
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„ 13	67. Robinson	—	148	140
„ 29	—	Robinson	151	—
Oct. 22	68. Robinson	—	151	142
Nov. 11	—	Sloane	156	—
Dec. 20	—	Sloane	158	—
Jan. 31	—	Sloane	159	—
Feb. 11	69. Sloane	—	138	—
„ 11	70. Sloane	—	160	—
Mar. 7	—	Sloane	161	—
„ 10	—	Robinson	162	—
„ 13	71. Robinson	—	163	142
1685. April 1	72. Robinson	—	165	142
„ 29	73. Robinson	—	165	144
May 9	—	Robinson	167	—
„ 12	74. Robinson	—	168	145
„ 19	—	Robinson	170	—
„ 22	75. Robinson	—	171	147
June 2	—	Robinson	172	—
„ 5	76. Robinson	—	173	148
Sept. 8	—	Robinson	174	149
„ 14	77. Robinson	—	176	151
Nov. 10	—	Sloane	177	—
„ 17	78. Sloane	—	179	—
1686. Mar. 27	—	Cole	181	—
May 7	—	Johnson	183	—
Aug. 10	79. Sloane	—	185	—
„ 24	80. Sloane	—	190	—
„ 24	—	Robinson	187	—
Oct. 29	—	Johnson	187	—
Jan. 29	—	Robinson	188	—
„ 29	—	Sloane	189	—
1687. April 1	81. Sloane	—	191	—
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„ 15	83. Aubrey	—	—	165

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„ 9	—	Lawson	197	—
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„ 5	86. Lister	—	—	136
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„ 20	88. Lhwyd	—	—	194
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Oct. 21	90. Sloane	—	211	—
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May 7	95. Lhwyd	—	—	206
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„ 17	—	Robinson	214	—
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„ 7	97. Lhwyd	—	—	208
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„ 25	—	Lhwyd	226	—
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„ 27	104. Lhwyd	—	—	217
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„ 17	106. Lhwyd	—	—	219
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„ 25	109. Lhwyd	—	—	221
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Jan. 18	110. Lhwyd	—	—	224
„ 21	—	Aubrey	239	—
Feb. 25	—	Robinson	239	—
„ 30	—	Lhwyd	240	—
Mar. 3	111. Robinson	—	245	—
1692. April 5	112. Lhwyd	—	—	226
„ 15	113. Robinson	—	247	—
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„ 25	114. Sloane	—	249	—

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„ 25	. —	. Hatton	. 255	—
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„ 26	. 132. Lhwyd	. —	. —	237
„ 29	. 133. Sloane	. —	. 268	—
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„ 26	. 134. Lhwyd	. —	. —	240
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„ 22	. 135. Lhwyd	. —	. —	242
„ 31	. 136. Sloane	. —	. 258	—
Feb. 28	. 137. Sloane	. —	. 261	—
n.d.	. 138. Robinson	. —	. 273	—
1694. April 4	. 139. Sloane	. —	. 275	—
„ 11	. 140. Robinson	. —	. 276	—
„ 13	. 141. Sloane	. —	. 277	—
„ 23	. 142. Sloane	. —	. 278	—
„ 24	. —	. Paschall	. 279	—
May	. [Paschall]	. —	. —	184
„ 25	. —	. Paschall	. 280	—
„ 27	. —	. Lhwyd	. 281	—
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„ 10	. 144. Lhwyd	. —	. —	247
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„ 20	. —	. Paschall	. 282	—
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„ 20	. —	. Robinson	. 283	—



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„ 12	149. Sloane	—	286	—
„ 21	150. Sloane	—	287	—
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„ 28	—	Lhwyd	290	—
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„ 22	161. Sloane	—	298	—
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„ 15	163. Sloane	—	301	—
„ 26	—	Vaughan and Wood	304	—
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„ 17	164. Sloane	—	306	—
Oct. 20	165. Sloane	—	307	—
Nov. 9	—	Connor	308	—
n.d.	166. Sloane	—	468	—
Mar. 10	167. Sloane	—	293	—
„ 22	168. Sloane	—	294	—
1697. April 2	169. Sloane	—	316	—
„ 13	170. Sloane	—	317	—
n.d.	171. Sloane	—	317	—
April 24	—	Vaughan and Wood	319	—
„ 27	172. Sloane	—	321	—
n.d.	—	Doody	322	—
n.d.	173. Sloane	—	464	—
May 12	174. Sloane	—	325	—
„ 15	175. Lhwyd	—	—	270
June 30	176. Sloane	—	—	104
July 15	177. Sloane	—	327	—
„ 19	178. Sloane	—	328	—
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Sept. 10	180. Sloane	—	330	—
Oct. 13	181. Sloane	—	331	—
„ 29	182. Sloane	—	331	—
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„ 27	. 192. Sloane	. —	. 339	—
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„ 28	. 195. Sloane	. —	. 341	—
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„ 19	. 197. Sloane	. —	. 344	—
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July 18	. —	. Wood	. 372	—
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Oct. 28	. —	. Camel	. 377	—
„ 28	. 219. Camel	. —	. 378	—
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„ 15	. 223. Petiver	. —	. 393	—

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Date.	Letters from Wray to—	Letters to Wray from—	1848.	1928.
			Page.	
1701. April 30	. 224. Lhwyd	. —	. —	278
May 3	. 225. Petiver	. —	. 394	—
„ 20	. 226. Petiver	. —	. 395	—
June 11	. 227. Lhwyd	. —	. —	280
Aug. 13	. 228. Lhwyd	. —	. —	282
„ 27	. 229. Sloane	. —	. 396	—
Oct. 10	. 230. Sloane	. —	. 398	—
Jan. 13	. —	. Preston	. 380	—
Feb. 3	. 231. Petiver	. —	. 388	—
1702. May 8	. 232. Derham	. —	. 399	—
June 11	. —	. Sherard	. 400	—
„ 30	. 233. Derham	. —	. 401	—
[ „ ] 25	. 324. Petiver	. —	. 403	—
Nov. 18	. 235. Sloane	. —	. 404	—
Dec. 11	. 236. Sloane	. —	. 405	—
„ 16	. 237. Sloane	. —	. 406	—
Jan. 14	. —	. Sloane	. 407	—
n.d.	. 238. Sloane	. —	. 408	—
Jan. 20	. 239. Sloane	. —	. 408	—
n.d.	. 240. Sloane	. —	. 410	—
1703. Mar. 29	. 241. Sloane	. —	. 415	—
„ 31	. 242. Derham	. —	. 414	—
April 14	. 243. Sloane	. —	. 416	—
„ 24	. 244. Petiver	. —	. 417	—
„ 27	. —	. Thoresby	. 418	—
July 27	. 245. Sloane	. —	. 430	—
Aug. 25	. 246. Petiver	. —	. 432	—
Sept. 1	. 247. Petiver	. —	. 433	—
„ 11	. 248. Petiver	. —	. 434	—
Nov. 17	. 249. Sloane	. —	. 436	—
„ 24	. 250. Sloane	. —	. 437	—
Dec. 1	. 251. Mott	. —	. 438	—
n.d.	. 252. Petiver	. —	. 461	—
Dec. 22	. 253. Petiver	. —	. 439	—
n.d.	. 254. Petiver	. —	. 440	—
Jan. 12	. 255. Petiver	. —	. 411	—
Feb. 13	. 256. Lhwyd	. —	. —	283
Mar. 8	. 257. Sam. Smith	. —	. 412	—
„ 17	. 258. Sloane	. —	. 412	—
*Mar. 5	. 259. Sloane	. —	. 441	—
1704. April	. 260. Petiver	. —	. 460	—
May 7	. 261. Sloane	. —	. 442	—
n.d.	. 262. Petiver	. —	. 443	—
June 8	. 263. Sloane	. —	. 444	—

\* The date should probably be April 5.



xxiv      CHRONOLOGICAL TABLE OF RAY'S LETTERS.

Date.	Letters from Ray to—	Letters to Ray from—	1848. 1928.	
			Page.	
1704. June 10	. 264. Sloane	. —	. 446	—
„ 19	. 265. Petiver	. —	. 447	—
Aug. 9	. 266. Sloane	. —	. 448	—
„ 9	. 267. Petiver	. —	. 450	—
„ 10	. 268. Petiver	. —	. 451	—
„ 16	. 269. Sloane	. —	. 452	—
„	. 270. Sloane	. —	. 453	—
Sept. 6	. 271. Derham	. —	. 455	—
Oct. 4	. 272. Sloane	. —	. 456	—
Nov. 1	. 273. Sloane	. —	. 457	—
Dec. 12	. 274. Sloane	. —	. 458	—
1704-5. Jan. 7	. 275. Sloane	. —	. 459	—
	(Last letter)			

## I.

### TWO SHORT LIVES OF JOHN RAY.

*SEVERAL* dates have been suggested for the birth of John Ray, the greatest all-round naturalist of his time. But although a register proves that some of these dates are impossible, no evidence has as yet been adduced in direct confirmation of the date, November 29th, 1627, which we have adopted as the probable one. The earliest printed sketch of a Life of Ray, by Dr. William Derham, was not published before 1760, more than half a century after his death. This was succeeded by a Life by Sir J. E. Smith in Rees's Cyclopædia; and both Lives, with an *éloge* by Cuvier, were reprinted as *Memorials of John Ray* with his *Itineraries* issued by the Ray Society in 1846. Even then the difficulties about the date of Ray's birth, November 29th, 1628, ordinarily accepted and inscribed on his tomb, were pointed out by the Rev. W. Garnons of Sidney College, Cambridge, but it was left for Mr. W. H. Mullens to consult the parish register and discover that there are entries relating to two John Rays on the same page, which are here reproduced. They read :

1627 John [son] of Roger and Elizabeth Ray [was baptised]  
Decemb[er] 6.

1628 John son of Thomas and Dorothe Wray, bapt.  
June 29.

The earlier entry relates to the man of science: the second to a wholly different person. It is so far satisfactory in that it shows that the day, Thursday, November 29th, ordinarily given as Ray's birthday, may be the correct day, but that the year should be 1627, and not 1628.

The date of his death, wrongly inscribed on his tomb as 17 January, 1705-6, should be, as Derham has it, 17 January, 1704-5.\*

A Life of Ray in manuscript came to the Bodleian Library with the great collections of Richard Rawlinson, but seems not to have seriously engaged the attention of Ray's biographers before Dr. Andrew Clark printed it some ten years ago in the *Essex Review*, under the title of "George Dale's MS. Record of John Ray." Dr. Clark's title was singularly unfortunate, because he himself pointed out that the MS. was not of George Dale's writing, but "a transcript by a very capable copyist." As a matter of fact the MS. is probably not a transcript, but the *original draft* for a Life of Ray by his great friend the botanist, Samuel Dale of Braintree.

The MS., shelf-marked as MS. *Rawlinson*, *Essex* 21, bears an inscription to the effect that it belonged to William Holman, of Halsted in Essex, on March 28th, 1776.

\* The confusions of Ray's dates have again been cleared up by Mr Miller Christy in his Report on "The Ray, Dale and Allen Commemoration Fund, 1912," printed in the *Essex Naturalist*, xvii, 1913.



1627.

Henry of Christopher and Mary Ingham Apr. 10.  
 John of Simon and Anne Symon Apr. 10.  
 Elizabeth of Henry & Elizabeth Ingham Apr. 16.  
 Francis son of Francis & Anne Byrd July 5.  
 Anne of John & Priscilla Simpson Aug. 9.  
 William of Thomas & Elizabeth Gilder Aug. 26.  
 Mary of Gregory & Mary Long Sept. 13.  
 Mary of William & Mary Corby Sept. 23.  
 Joan of John Michel Decario & Anne his wife Octob. 7.  
 Elias of Elias & Mary Wright Octob. 18.  
 Israel of Israel Dupont Decario & Anne his wife Octob. 23.  
 John of Roger & Elizabeth Ray Decemb. 6.  
 Francis Jr. daughter of Tho & Francis Ewerd of  
 his wife Notley Feb. 7.  
 John Jr. son of John Meale and Sarah his wife  
 Feb. 7.  
 Margaret Jr. daughter of John Burdige Feb. 25.  
 Susan Jr. daughter of James & Susan Elder Mar. 30.

THE RECORD OF THE BAPTISM OF JOHN RAY, DEC. 6, 1627.

1628

Maria Jr. daughter of Marie Guildenbapt. June 10.  
 William Simpson son of Will & Elizabeth Simpson June 10.  
 Isaac son of James & Anne Burdige June 26.  
 John son of Thomas and Dorothy Wray bapt. June 29.  
 William Jr. son of William and Esther Gilder was  
 baptised 2nd Sunday of October, Anno 1628.  
 It being of  
 was baptised 1st Sunday October Anno Domini 1628.  
 Samuel Jr. son of Samuel & Anne Ewerd  
 was baptised 2nd Sunday 20th Ann Domini 1628.  
 Jerome Jr. son of Robert & Elizabeth Ewerd bapt. 2nd  
 Sunday Ann Domini 1629.

THE RECORD OF THE BAPTISM OF A SECOND JOHN WRAY, JUNE 29, 1628.

Extracts from the Register of Baptisms in 1627 and 1628 at  
 Black Notley.

From *British Birds*, ii, p. 296, 1909.



## THE LIFE OF MR. RAY BY MR. DALE OF BRAINTREE.

On the 17th of January 1705, Died that great Father of the Botanick Science, Mr. John Ray, at his house in Black Notley in the County of Essex, in which Parish he was likewise born on the 29th of November 1628, being the son of one Roger Ray, by profession a blacksmith. Yet was not his Father's fortune at so low an Ebb, but that he could afford this his Son liberal education, the first rudiments of which was at a Grammar School in Braintree-Church, under the tuition of one Mr. Love where he profitted so well that, on the 28th of June 1644, he was admitted into Catherine-Hall in Cambridge, where he continu'd about a year and three quarters, and then remov'd himself to Trinity-College, of which he was admitted one of the Minor Fellows on the 8th of September 1649; and, about six months after, one of the Major Fellows. He was after that one of the Senior-Fellows of that College, but when admitted, or how long he continued so, cannot be known, there being a chasm for many years in their books. Upon the Restoration in 1660 he return'd to be one of the Major Fellows.

In 1658 he first began to travel in search of plants, and other Natural and Artificial Curiosities (those of Cambridgeshire being well known to him before), and from Cambridge rode to Chester, from whence he went through part of Wales into Shrewsbury, and returned by Gloucester.

In 1661 he accompanied Mr. Willoughby and others into the North of England, and from Berwick they made a Tour into Scotland, and, having visited Edenburg, Sterling, Glascow, and other places of note, return'd into England by Carlile.

The next Year they made a Western Tour, going from Cambridge to Chester and thro' Wales into Cornwall, Devonshire, Dorsetshire, Hampshire, Wiltshire, and others, and return'd to London by Windsor.

In the year 1663 [April 18], he travel'd with the

said Mr. Willoughby, Mr. Skippon and Mr. Bacon, thro' Holland, Germany, Italy, France, etc., of which he hath already publish'd an Account.

In 1667 he and Mr. Willoughby made a 2d. Tour into the West of England, in which they visited Worcestershire and all the Western Countys; and upon his return to London (viz. Nov. 7) he was admitted Fellow of the Royal Society.

The following year he visited Kent alone, and afterwards made a 2d. Tour into the North; but, being seiz'd with the Meazels in Westmoreland, he proceeded no further, but went to the House of his dear Friend Mr. Willoughby at Middleton.

In the year 1671 he made a 3d. Tour into the Northern County of England, being accompanied by Thomas Willisell, an expert Botanist.

Besides these, he made divers small Journeys into Essex, Suffolk, Norfolk, and Sussex, collecting many useful Observations, Itenerarys of which he left in Manuscript worthy to be printed.

July 1673 he married Margaret one of the daughters of John Oakeley of the Parish of Launton in Oxfordshire, Gent., a younger branch of the Shropshire Family, by whom he had only four daughters, three of which survive him.

After his Marriage he continued in Warwickshire until Michaelmas 1677, when he return'd into his native country; and, having lived about a year and three quarters at Faulkborn-Hall, he removed into Black Notley into a House of his own erection, where, to use his own words, *He intended (God willing) to settle for the Short Pittance he had yet to live in this World:* which accordingly came to pass.

As to the Casualties of his Life and his Deseases, I find nothing noted by him in his Diary except the Measels aforesaid, and, altho' he had had the Small Pox, yet it was in his younger years, before he began to keep an account. The latter part of his Life was accompanied with much pain, occasion'd by certain ulcers in his legs,



which, altho' they would make him often complain, yet did they not hinder him from prosecuting his studies until about three months before his death.

As he was not born to any paternal estate, so he was never master of any great one ; he never made it the labour of his life to Live Great (having often refus'd Preferment) but to be content with Agar's Portion. The aforesaid legacy left him by Esqr. Willoughby being by much the greatest part of what he enjoy'd in this World.

He was Author of many excellent Books, of which a Catalogue is already printed before his *Methodus Insectorum*, printed 1705.

Had it pleas'd God to have continued him some time longer, the World would have been oblig'd with an History of Insects, the Title of which he intended to be

“ *Historia Insectorum, precipuè Britannicorum, quam nunc conscribere aggredior. A celeberrimi viri, Amici nostri æternum honorandi, D. Francisci Willoughby, Armigeri, notis et Observationibus maximam partem desumpta est. Additis quam post ejus mortem vel nobis sedulo indagantibus inventa vel ab Amicis hanc Historiæ Animalium partem colentibus communicata sunt.*”

But Death preventing him, the Copy (which is the only one he left, besides his Iteneraries aforementioned), remains yet unpublished, altho' he had made a large progress in it.

And so famous was he in Foreign Countries that a Correspondence with him was desired by all the Learned Men of his time.

*His Character.* In his Conversation he was affable (being not puffed by his Learning) and always communicative of anything he was Master of. In his Dealings he was very consciencious, and so entirely scrupulous about Oaths that he never took *the Solemn League and Covenant* in the late unhappy times, beleiving it an unlawful Oath, as he hath often declared. So upon



the 24th of August 1662 he quitted his Fellowship aforesaid, because he could not, in the Oath of Abjuration, swear that he did believe it was [not] binding to others.

In his life he was Charitable to the Poor, according to his ability; sober, frugal, studious and religious, allotting the greatest part of his Time to the Service of God and his Studies.

As to his Religion he was a Member of the Church of England, being ordained both Deacon and Presbyter by Robert, then Lord Bishop of Lincoln, in his Chappel at Barbican near London, on the 23d. of December 1660, and in this Communion he did continue unto his dying day.

As his Death came not to him unexpected, so it found him not unprepar'd, he being found in all the duties of a good Christian, but relying upon the Merits of his Saviour Jesus Christ in his Hope of Glory.

As to his Worldly Estate he settled all upon his Wife and Daughters, except a small Legacy to the Poor of his own Parish and 5*li.* to Trinity College to buy Books for the Library.

All his Collections of Natural Curiosities he bestowed upon his friend and neighbour, Mr. Dale, to whom he caused them to be deliver'd about a week before his Death.

And as this learned man never affected pomp in his lifetime, so at his death he desired to be privately buried, ordering his corps to be nailed up that none might see him, and altho' the Reverend Rector of the Parish offer'd him on his death bed a place of interment in the chancel of his church, yet he modestly refused it, choosing rather to be buried in the church yard with his ancestors.

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During Ray's abode at Falbourn Hall, his mother, Mrs. Elizabeth Ray, died at Black Notley. Ray thus recorded her death:—

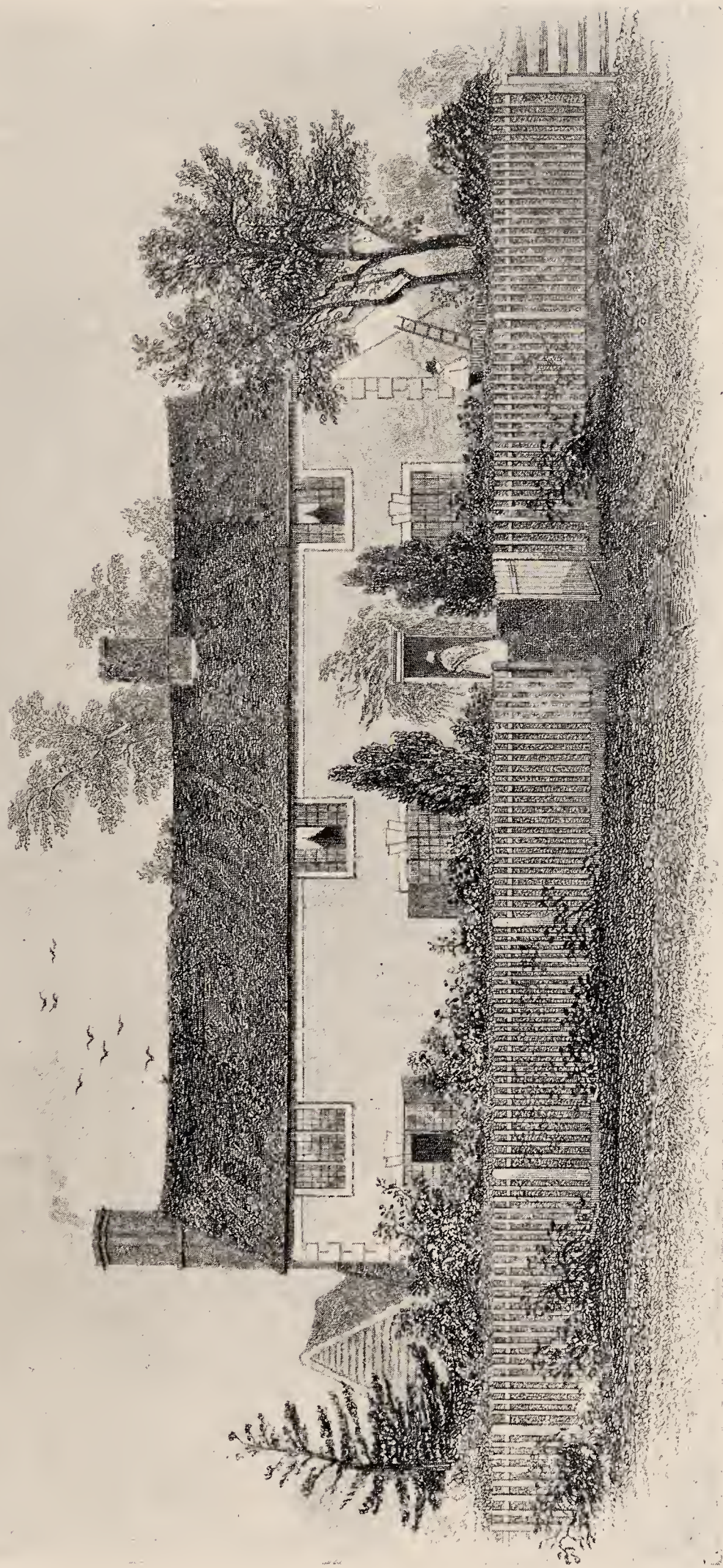
“ March 15th, 1678, being Saturday, departed this life, my most dear and honoured mother, Elizabeth Ray, of Black Notley, in her house on Dewlands, in the hall-chamber, about three of the clock in the afternoon, aged, as I suppose, seventy-eight, whose death, for some considerations was a great wound to me ; yet have I good hope that her soul is received to the mercy of God, and her sins pardoned, through the merits and mediation of Jesus Christ, in whom she trusted, and whose servant she hath been from her youth up, sticking constantly to her profession, and never leaving the Church in these times of giddiness and distraction.”\*

In the following year Ray took up his abode at Dewlands, saying, “ I intend, God willing, to settle for the short pittance of time I have yet to live in this world.”

A second brief Life is contained in a small notebook written in 1711–12 by the apothecary and naturalist, James Petiver, an intimate friend of Ray, which is now No. 3338 among the Sloane MSS. in the British Museum. The late Mr. Boulger, who printed it in the *Essex Review* for April, 1917, considered it to be a transcript by Petiver of a first sketch by Dr. William Derham of the memoir published by George Scott in the *Select Remains of the learned John Ray* in 1760, and reprinted by Dr. Edwin Lankester in his *Memorials of John Ray* (1846). From the allusion to the *Synopsis Avium*, which was published in 1713, it would appear to have been written about 1711, and immediately before Petiver transcribed it. It seems likely that the author had seen Dale's sketch for a Life printed above. It is interesting to compare the two Lives, and, as Boulger has pointed out, to compare the

\* Quoted from G. Scott in *Memorials of Ray*, 1846, p. 37, note.





“DEWLANDS,” THE RESIDENCE OF JOHN RAY AT BLACK NOTLEY.

*(From the engraving presented to the Ray Society by Mr. J. H. Pattison in 1848.)*





way in which Ray's resignation of his Fellowship in 1662 is spoken of by a sturdy nonconformist like Dale, and by an unorthodox clergyman of the Established Church such as was Derham. A further insight into Ray's religious views is contained in his letter to Courthope printed on page 18.

“ A SHORT ACCT OF YE LIFE OF YE JUSTLY FAMOUS, &  
NO LESS LEARNED MR. JOHN RAY.

He was born att a village in Essex call'd Black-Notley on Nov. 29, 1628, was bred up att Braintree school a neighbouring town; from whence he was sent to Catherine Hall Camb. & was admitted there June 28, 1644, & continued there  $1\frac{3}{4}$  years, & then removed to Trinity Colledge, where, Sept. 8, 1649, he was chosen Minor-Fellow, and 6 months after that Major-Fellow, & after that Senior Fellow. His Genious leading him to Physiology, particularly Botany; after he had acquainted himself with what was observable abt Cambridge, in 1661, he, with Mr. Fra: Willugby & others visited ye North, as far as Berwick, & thence to Edinburgh, Sterling, Glasgow, & other parts of Scotland, returning by Carlisle. The next year they made a Tour by Chester into Wales, Devon, Cornwall, Dorsett, Hants, Wilts, Berks by Windsor to London &c.

In 1663, 4 & 5 he, with Mr. Fr. Willugby, Sr. Ph. Skippon, Mr. Bacon, &c. travelled thro' Holland, Germany, Italy, France &c. of which he published an account in his Topographical &c. observations.

In 1667, Mr. Willugby & he, visited Worcestshr. & all of ye Western Parts & att his Return to London he was admitted F.R.S. Nov. 7.

The next year he visitted Kent, & after that ye North again, but being seized with ye Meazles in Westmorland, he went no farther, but return'd to his dear Friend Mr. Fr. Willugby att Middleton in Warwr. In 1671, he again visited ye North of Engld., accompanied with

T. Willisel a servant of Mr. Willugby's, who, altho' ignorant of all ye learned languages yet by his great perspicuity to, and Diligence in Botany had made himself a great Mr. thereof, & travilled into America in ye Inquest of Vegetables. It would be tedious to persue our Great Man's lesser journeys into Essex, Suffolk, Norfolk, Surry, Sussex, &c. Of all these preceding Tours he left behind him Journalls, some of which he had himself fitted up for ye Press, ye rest remaining as he had rhapsodically written them in his Travells, all which I saw in Mr. Dale's hands who promised me to publish them.

I have thus specified his Travells to show his great diligence in his persuits of Ntral. Knowledge : & no less weary was he in ye Persuits of his Studies, the good effects of which were more seen in the world by his many usefull books, than in his Health, which was doubtless much impaired thereby, together with his sedentary life which in all probability was the cause of the Ulcers in his Leggs, that much afflicted him many years before, & until his Death. What Books he published may be seen in the Catalogue of them prefixed to his *Method. Insectorum*, which was ye last thing he published, & which if God had given him life would have been followed with a large History of Insects, which Posthumous work our Royall Society published (after his Death) to preserve it from being lost & to assist others that should undertake that Subject. Besides ye Books he publish'd in his lifetime, he had fitted up another for ye Press about 1693, which he entitles *Synopsis Methodica Avium & Piscium*, which by ye negligence of ye Booksellers lay unpublished, untill being lately found by chance ye MSS. was putt into my hands, & is now nearly finished in ye Press.

As to ye other Passages of his life, a briefer account may suffice. His dear Friend Mr. Fr. Willugby, had that opinion of his integrity, & confidence in his Freindship that he left him a Trustee of his Will together with an Annuity of 60*li.* dureing his life.



After Mr. Willugby's Death about ye 46th year of his Age, our great Man married Margaret daughter of Mr. John Oakley of Launton in Oxfordshire by whom he had 4 Daughters 3 of which survived him, & onely [one] of which is since married.

He lived some time after his Marriage in Warwickshire, & thence removed about Michaelmass 1677 into Essex his Native country, spending ye greatest part of ye remainder of his Days in an house of his own erection in Black Notley in which he died Jan. 17, 1705.

He was both Deacon & Preist of the Church of Engld. ordain'd about 1660, by the learned Bp. Sander-son, altho for some few (& if it was not too presumptuous would say trivial) reasons, he could not comply with ye Bartholomey Act, & consequently not execute his Function, yet he was a strict as well as pious & exemplary Conformist to ye establish'd Church as the constant tenour of his life, as well as a Noble Declaration to ye Rector of his parish shewed.

As to his Learning his Physiological works show how excellent a Naturalist he was, as his Theological show how good a Divine, but by his papers in my hands, I find him to have been an excellent Orator in ye University, & a good Preacher, & a good Crittick in Greek, & Lattin, skill'd in Hebrew not to name ye modern Languages French & Italian, which he understood, & as he was well skill'd in most parts of Learning, so he was as ready to communicate it, and as humble in his opinion of himself & it.

He was a man of excellent Natural Parts, and had a singular vivacity in his Style, whether he wrote in English, or Latine, which was equally easy to him, all which (notwithstanding his Age & the debility & infirmities of his body) he retained even to his Dying day ; of which I have seene good evidences now by me in some of his Lettrs. written manifestly with a dying hand.

In a word in his dealings no man more strictly just ; in his Conversation, no man more humble, courteous and affable ; towards God, no man more devout ; &

towards ye poor & distressed no man more compassionate & charitable according to his abilities.

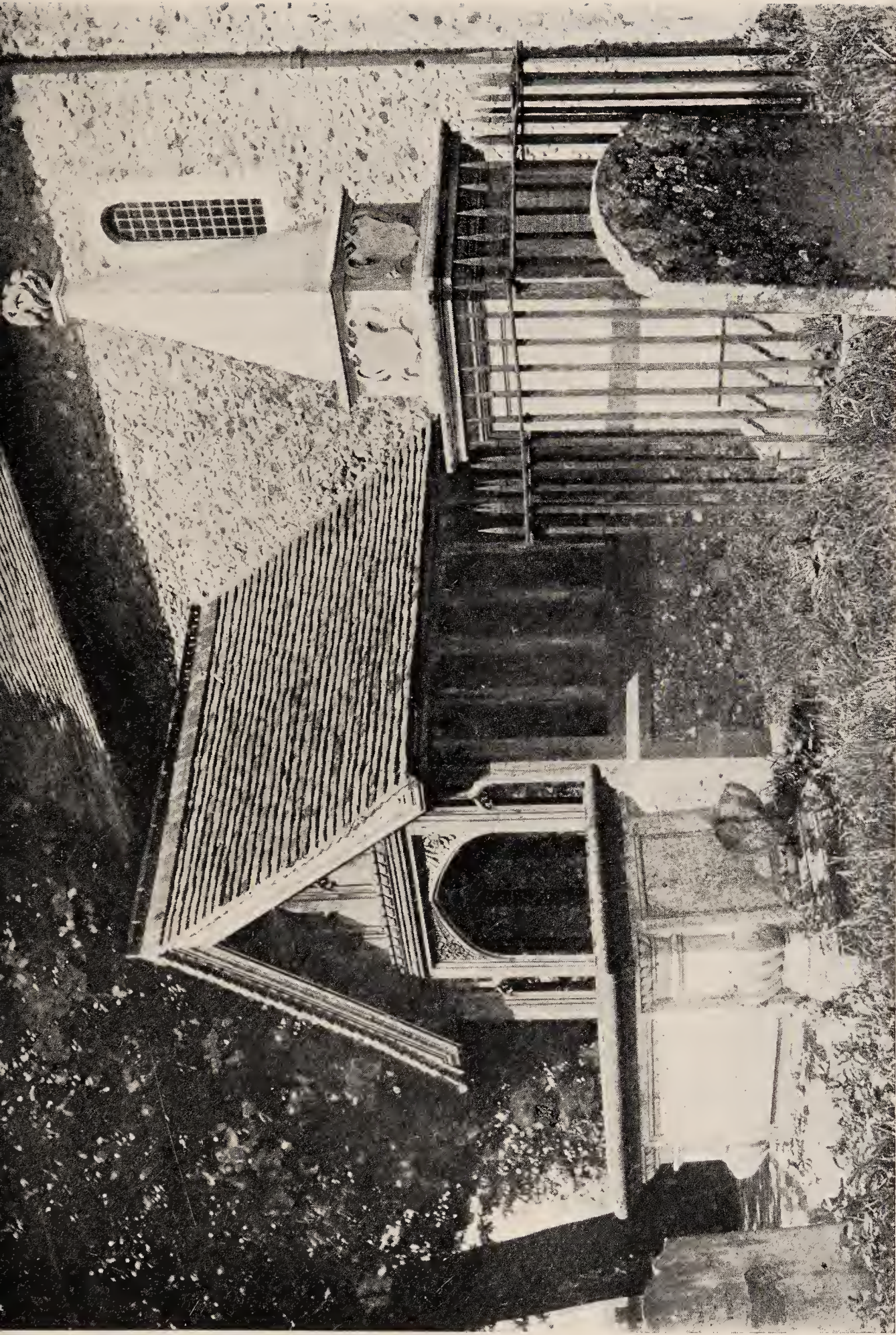
He was buried (according to his desire) in Black Notley Church-yard, where a small Monument is erected for him, att ye charge of some of his freinds, with this following Inscription

The inscription is, however, omitted. It was composed by the Rev. William Coyte, and was carved in forty-seven lines upon the pyramidal monument erected at the expense of Henry Compton, Bishop of London. The Latin original is printed on page 52 of the *Memorials of John Ray*, and in an English translation in the *Journal of the Proceedings of the Essex Field Club* for 1885, p. clxiii. The monument was restored in 1737 by Dr. Legge; in 1792 by Sir T. Gery Cullum; in 1844, after a visit of the Linnean Club and the foundation of the Ray Society; and once again in 1912 under the auspices of the Essex Field Club.\*

A longer “‘Life of Mr. Ray,’ as left in the handwriting of William Derham D.D., Canon of Windsor and F.R.S.,” was found at Netherton. It was annotated and continued by Mr. George Scott, and is now in the library of the Botanical Department at the British Museum.

\* Miller Christy, “‘The Ray, Dale and Allen Commemoration Fund, 1912: First and Final Report,” *Essex Naturalist*, xvii, 1913.





DR. BENJAMIN ALLEN, 1663-1738.

JOHN RAY, 1627-1705.

THE TOMBS AT BLACK NOTLEY.





## II.

THE CORRESPONDENCE BETWEEN RAY AND  
PETER COURTHOPE OF DANNY, 1658-1673.

The earliest series of letters written by John Ray were not known either to Dr. Derham or to Dr. Edwin Lankester when he re-edited Ray's correspondence in 1848. But thanks to the kindness of their owner, Mr. Campion, they were partly made public by the Sussex Archæological Society in 1858, from whose journal this account has been derived.\* They are of so much interest, and are practically unknown in scientific circles, that they are well worth reprinting, if only to suggest the desirability of the publication of complete copies of the manuscripts, which at present are unfortunately not available for study and have not been accurately reproduced.

The original letters are believed to be preserved in the fine old house at Danny, the residence of Ray's friend and college pupil, Peter Courthope, who had succeeded to the Danny estates on the death of his grandfather, Peter, in 1657. With these are a few letters from Courthope's cousin, who is referred to as

\* R. W. Blencowe, *Extracts from the Manuscripts in the Possession of William John Campion, Esq., at Danny*, Sussex Archæological Coll., 1858.

“J. L. Willoughby,” but who we are inclined to think was no other than Ray’s great friend Francis Willughby. There is good reason for believing that Mr. Blencowe misread the double f standing for ffrancis in Willughby’s signature as J. L., for in the signature “ff Willughby” written in a Bodleian register of readers in 1660 the second f is made with a tail like an L. One of the earlier letters is from Willughby to Courthope proposing an antiquarian research, adding that he was meditating “a little expedition into Kent; and if it bee not possible to meet you otherwise, I shall not value the riding of forty miles to Danny.”

The extraordinary high regard in which Ray held both Willughby and Courthope is shown in the preface to his *Catalogue of Cambridge Plants* published in 1660 :

“Jam quoniam honestum est fateri per quos profeceris generosissimi Juvenes, D. Franciscus Willughby et D. Petrus Courthope Armigeri, natalium splendore ingenii sublimitate, suavitate morum, fide, virtute illustres, non rei duntaxat herbariae callentissimi, sed in omni literarum genere versatissimi, amici nostri, plurimum honorandi, non sunt a nobis silentio transmittendi, ni ingrati et arrogantes esse velimus. Horum opera nos saepius usos et ab his non mediocriter adjutos fuisse in hoc opusculo concinnando, libere et ingenue profite-  
temur.”

Ray’s letters to Courthope were not addressed direct to Danny, but to a London agent who handed them to the Sussex carrier when he called. For this purpose Ray made use of the Red Lion, in Thames-street, near Billingsgate, while Willughby addressed his letters to

His most honored cosen, PETER COURTHOPE Esq.

To be left at Mr. Faye’s, an apothecarie’s shop at the sign of the Sugar Loafe, neere the Conduit in Fleet street, London.



Several of Courthope's Cambridge friends are mentioned in a note written by John Goodyer inside the cover of his copy of the *Catalogue of Cambridge Plants* published in 1660.

Received this instruction of  
 23 July Mr John Mapletost, tutor to the Earle of  
 1659 Northumberland's son ?  
 and of Mr John Snagge an Apothecarie  
 of Petworth.

Mr John Kid  
 Mr John Wray  
 Mr Thomas Lockley  
 Francis Willuby Esq  
 Mr Peter Courthop  
 All of Trinitie Colledge in Cambridge

Francis Willuby<sup>gh</sup> Esq of Middleton neare  
 Coleshill in warwickshire, Sr Francis  
 Willughbys son.

Mr Peter Courthop of Darny in Suffe  
 on this side Lanes.

10 May 1660 — 2<sup>6</sup> 67

written by Mr John Kid, who is dead.  
 by { Mr John Wray

of Trinitie Colledge in ~~ancient~~ Cambridge

Extracts from seventeen letters from Ray to Courthope are given below. The first was written when he was Junior Dean of Trinity College.

1. *Danny Papers.*

MR. WRAY\* TO MR. COURTHOPE.

January 3rd, 1658.

Sir,—I have little good news to acquaint you with, which made me the slower in returning you an answer. Our friend Mr. Nid† is so farre from losing his ague, that he is brought exceedingly low, and is very much weakened by it; indeed, so ill is he at present, that if there be not some speedy amends in him, I shall not be very sure of his life. He is now come to physick and a nurse. If you stay long in the country, possibly, though I hope otherwise, you may never see him in this world any more.

Having mentioned to his friend that he was thinking of taking a college living—Cheadle, in Staffordshire, worth £100 a year—he continues :—

My present condition is such that I must of necessity enter into orders, or else live at great uncertainties, and expose myself to the mercy of men for my livelyhood and continuance here. I am not resolved to enter into orders, if so be I stay here, but rather the contrary, it consisting not with those designes which I intend to pursue. Now, if I shall bid farewell to my beloved and pleasant studies and employments, and give myself up to the priesthood, and take to the study of that which they call divinity, I thinke it were the best way to throw myself into the country, and make such provision for this world as other men doe, and make it my business to execute the priest's office. I have sent

\* So he spelt his name in the earlier part of his life; he dropped the first letter afterwards, having ascertained that such had been the practice of his family before him. (Derham.)

† John Nid was a very dear friend of Ray's, and the latter preached his funeral sermon at Trinity College. Nid died of this illness.

to you to learn your opinion concerning this affaire, being resolved to be ruled by the concurrent suffrages of my friends, of whom, sir, I esteem you among the principal and of the prime magnitude. That you may not think me a drone, and “*inutile telluris pondus*,” I shall tell you that which I am now very busy in doing. Mr. Pockley\* and myself have resolved to performe all the easie and useful experiments which we find in bookes, &c., so we thought to have sent to you to procure an iron retort, like to Glauber’s in the second part of his *Philosophical Furnaces*,† but knew not how to find you a model of it. It would be useful to us for many operations if we had it.

### 3. *Danny Papers.*

MR. WRAY TO MR. COURTHORPE.

Sept. 26th, 1660.

Sir,—Last night, as soon as I was returned out of Essex, I received yours, by my pupill, T. Burrell, wherein you do rightly guess that I did accompany Mr. Willughby in his travels this summer. . . . During my absence, Dr. Fern,‡ who is made master of this colledge, by C. R. [Carolus Rex?], having obtained a letter from the said C. R., to restore the old Fellows, and fill up the remainder of the fellowships with such of the new Fellows as should be found worthy, came down hither, about the beginning of August, with 14 or 15 of the old gang; who, having constituted, among themselves, a seniority, swore again, and then forsooth readmitted all the new Fellows, except Dr. Pratt, Mr. Disney, Scott, Davies, Senior, Long, White, Wilkes, Castle, West, Oddy; and, at that time, Hutchinson was

\* Thomas Pockley, M.A., fellow of Trinity College, 1650.

† Glauber, *Description of New Philosophical Furnaces*, 1651.

‡ Afterwards Bishop of Chester. As one of the King’s chaplains, he attended, with others, the Commissioners at the abortive treaty at Uxbridge. Their duty was to assist them in their devotions, and advise with them for the service of the church, as the management of the treaty might require.—*Clarendon*.



also omitted, whom since, I hear, they intend to admitt. I being then out of towne, and they having information that I should refuse the Common Prayer, surplice, &c., they had well near passed me by ; but by the mediation of some, they were content to reserve my place, in case I would promise conformity. I wish they had spared themselves that trouble. About a month after that, I came hither, but am not as yet admitted ; Dr. F. hath been ever since out of towne. He returneth hither on Thursday next, they say, when I must expect my doome. I have long since come to two resolutions, namely, no promise of conformity, and no orders, “*rebus sic stantibus*,” whence you may easily judge where I am likely to be. They have brought all things here as they were in 1641 : viz., services morning and evening, surplice Sundayes, and holydays, and their eves, organs, bowing, going bare, fasting nights; they have abrogated the common chamber, &c. Jammy,\* who is now Doctour, hath put one of the old fellowes, Chamberlain† by name, into your chamber, so that your cousin, coming in my absence, was fain to shift as well as he could for a lodging. If you come you will see a new face of things. You must get a sarke, if you intend to continue any while ; but I believe you will thinke it now seasonable to break off, and depart. . . . I had much more to write, but I hope I shall see you before I remove, which will be about the beginning of December.

Your obliged servant and orator,

JO. WRAY.

During the two following years, Ray resided at Trinity College, having a great reputation as a tutor ; and the next letter shows the affectionate interest he felt for his pupils.

#### 4. *Danny Papers.*

June 11th, 1661.

Sir,—Since my last letter to you, there hath befallen

\* Name probably wrongly transcribed.

† Probably George Chamberlaine, Vice-Master of Trinity College, 1666–88.

me a very lamentable accident, which, though it concerns not you much to know, I am sure you will commiserate my calamity, and condole with me, and soe in my conceit at least ease me of some part of the burden which I shall be bold enough to communicate to you. A gentleman, your countryman and neighbour, and not unknown to you, by name Mr. Goring of Hydon, lately brought hither his eldest sonne,\* and by Mr. Lynnett's† direction, and upon his commendation, admitted him, under me, fellow-commoner, on Saturday was seven-night last. The gentleman himself, whom, by the way, I must needs commend for his ingenuity and sweetnesse of disposition, went away on the Monday following, and left his sonne with Mr. Lynnett and myself, who, within an hour of his father's departure, I cannot say fell sick, but began to complaine. His disease proved to be the small-poxe, which, notwithstanding all the care and diligence which could happily be used, through the mere malignity of the disease, heightened by the sudden change and excessive heat of the weather, he died about one o'clock on Saturday night. This gentleman never came into the hall, nor wore his gowne. He was of a handsome countenance, of his father's temper and disposition, and great hopes. This dismal event makes me far more willing to abdicate my pupils and knock them off, than before. . . . All my study now is to contrive how his father may be satisfied of what is most certaine, the care and tendernesse I had of his sonne, and the great earnestnesse I used to preserve his life, had Providence favoured me.

In the same kind spirit did he write, to tell him of the sickness of Timothy Burrell, another pupil.

### 5. *Danny Papers.*

Sir,—I render you most hearty thanks for your kind

\* According to Venn, Edward Goring was admitted fellow-commoner of Trinity June 1, 1660, and died June 8, 1661, aged 17. The admission date may be wrong.

† William Lynnet, D.D. of Trinity, who was Senior Proctor 1660–1. Blencowe printed "Lynell."



expression of good will and affection. I had scarce half concocted the grief and perturbation attending the calamity mentioned in my last, but a new trouble assaults me, I mean the sickness of your cousin. He fell into a feverish distemper about nine weeks since, which, after about a fortnight's space, he hardly got quit of without either phlebotomy or purgation. But now again, to my great sorrow and disquiet, by a very little error, he is fallen into the like distemper. Now, sir, I have thrust myself into such a necessity of beginning a journey into the North to-morrow, that I know not how to deferre it, and so must be forced to leave him in this feverish condition, which I am most heartily loath to doe. I pray, sir, speedily acquaint his friends with what I write to you. Had I not engaged myselfe before I knew of his illness, I would by no means have left him, though I doe not conceive any great danger, the distemper being not violent ; I hope he will doe well again, but he hath a very nice and ticklish constitution of body, and is easily put out of order. I should be glad he were with his friends in the country, but he is not in a fit case to travel at present. My mind is full of this businesse, so that I have neither will nor leisure to write about anything else.

When, however, it came to the point, he wrote to Courthope that he could not resolve to leave Burrell.

## 6. *Danny Papers.*

[Trinity College, July, 1661.]

Honoured Sir,—The continuing distemper of your cousin, with his unwillingness that I should leave him in that condition, caused me to alter my former resolutions, and to defer my journey northward till I might see him in a probable way of recovery, or at best under the care of his most tender relations, which is now in part come to passe. For he is both in a fair way of convalescency, unlesse his voyage sets him back, and also coming under the care and nurture of his indulgent



mother. I intend now to set out on Monday next\* ; too late in the year, I confesse, in relation to the inquisition of plants, but a more convenient time to travell, in regard to the temperature of the weather and season of the yeare. My company is only Mr. Skippon and a servant† ; the utmost terme which we propose for our journey is Edinburgh ; the time we intend to spend is at most six weeks. Our stages we have contrived to be Peterborough, Boston, Lincoln, Hull, Yorke, Knaresborough, Gisburgh, Durham, Newcastle, Alnwick, Barwick, Edinburgh. We have this year made a more narrow search into the countrey about Cambridge for plants, and have discovered in all about twenty-six that are not in our catalogue—some such as I had not seen before, nor are mentioned to grow wild in England. . . . ‡

God willing, I shall give you an account of our travels northward. In the mean time I shall not be unmindfull of you upon all occasions, nor omitt my most ardent votes and oraisons daily, for a confluence of all blessings and felicities upon you. . . .

Your most obliged and devoted servant.

J. WRAY.

It was on this journey that Skippon and Ray on entering Edinburgh saw the ghastly sight of the heads of Argyle and Guthrie fixed on the gate and the Tolbooth. At the same time many poor unfortunate women were burnt for witches, “they reported to the number of 120.”

The next letter appears to have been written in reply to one from Courthope, who was suffering from ague then prevalent at Cambridge, as to the efficacy of Jesuits’ bark as a remedy. Ray had previously written to him for advice as to whether he should take a living.

\* “July the 26th, 1661, we began our journey northwards from Cambridge,” Ray, *Itineraries*, where the journey is fully described.

† This statement disproves the note that “Willughby was one of the company” on pages 13 and 131 of *The Memorials of John Ray*, 1846.

‡ A long list of plants was unfortunately omitted by Blencowe.

9. *Danny Papers.*

Coll. Trin. Oct. 14th, 1661.

Ray begins this letter with a compliment to Courthope's style, telling him "that he wrote like a master of the English language, which he accounted no mean accomplishment," and then goes on to say :—

Your advice concerning the living came too late for my direction, although not unseasonably to confirme my choyce. I have let go the living partly for those reasons you alleage, and partly because, upon further inquiry, I find the yearly value to be lesse than it was at first represented.\* One great motive to have induced me to take it was, because of its vicinity to the Yorkshire Alpes, and especially Ingleborough Hill, which is not above sixe or seven miles thence distant. Indeed the whole countrey of Westmoreland,† for variety of rare plants, exceeds any that I have travailled in England; perhaps Carnarvonshire, in Wales, may vie with it. You desire my opinion as concerning the *pulvis de cortice Per.*: truly I am not competent to give you advice, as having never made or had any experiment of it myselfe. I have indeed read and heard often of it, and so can give you the opinions of other men about it, of which I suppose you are not ignorant. Chiffletius‡ (who hath written a book about it) tells us that the use of it is disallowed by the plurality of the physicians of Italy and the Low Countries; for that, though it prevents or removes the fits, yet oftentimes it gives occasion to other more dangerous diseases, so that it is not safe. I have heard that it hath been beneficiall to some ancient people, by taking away their fits for the present, till they could recover strength enough to conflict with the disease. Few that I have heard of, have been so relieved by it as to get quit of their agues

\* The living was Kirby Lonsdale, supposed to be worth £120 a year.

† Ray collected plants at Shap on 29 August, 1662.

‡ Blencowe notes that Chiffletius, physician to Archduke Leopold William, administered Jesuits' bark to his patron at the wrong time of his attack of ague, and that it went out of fashion in England in consequence of Alderman Underwood having died whilst using it, in 1658.



without danger of a relapse, or contracting a more malignant and perillous distemper ; and therefore your friends here, to whom I communicated this your purpose, dehorted you from the use of so slippery and ambiguous a medicine, unless yourself hath better experience of it than we. Mr. Budgen,\* your countryman, who is not only a pretender to, but lately a practitioner of, physick, thinkes it most advisable, proper, and convenient for you to permitt your quartan to have its course. I have known many cured by the use of the antimoniall cup, but yet would be loath to counsel you to use it. Mr. Lynett thinkes that the country whereabout you live, is an aguish place, and that it would be convenient to remove to London awhile ; but I cannot persuade myself to be of this opinion. I see that quartanes seize upon citizens as well as those that live in the countrey. Mr. Budgen talkes of a sneezing powder that he used himselfe, which he thinkes might be proper and convenient for you to use. I should not promise you any great relief or advantage from such a medicament.† . . . We have lately had here an election for Fellowes ; of seventeen that sate, thirteen were chosen, whose names I have sent, in the inclosed, to T. B. They have elected six supernumeraries. I am at present resolved to discontinue from the colledge so soon as I shall have made even my accounts therewith. . . . I thought to have written something of our voyages and adventures in Scotland, but it's high time to break off ; all that I shall add, is that

I am your most obliged devoted servant,

JOHN WRAY.

\* John Budgen, M.D., Fellow of Trinity College, died 1671.

† There were many curious recipes in vogue in those days, and very quaintly recommended. Dr. Gerard, writing in 1633, of a plant called "Solomon's Seal," says, "It taketh away in one night, or two at most, any bruise, blacke or blue spots gotten by falls, or by women's wilfulness in stumbling upon their hastie husband's fists." Ray attributes his recovery from the jaundice to a nostrum too coarse for modern ears ; and when one of his daughters died of the same disease, nothing, he said, afflicted him so much as that he had not tried the remedy which had been so effectual in his own case. (B.).



At the same time Willughby wrote to Courthope concerning his malady :—

I never heard a word of you since I saw you at London, till just now, in a letter from Mr. Wray, that brings me the very ill news of your ague, for which I am most heartily sorry. I doubt not but your youth and courage will bravely overcome it : the best course is, no physick, a verie spare diet, warmth, and to cheere up your spirits as much as you can.

There is an allusion to sickness in Trinity College in Ray's next letter also :—

### 10. *Danny Papers.*

[1661.]

Sir,—Since the writing of the enclosed, which should have been sent you last week, I had the happiness to see your old chamber-fellow, Mr. Campion,\* who is, in my judgement, since his departure hence, very much improved, not only in growth and stature, but also in discretion and understanding. . . . I doe intend the next yeare, “Deo vires et valetudinem largiente,” to accompany Mr. Willughby into Wales† ; and, if you could soe order your affaires as to find time enough to goe along with us, there could, in my opinion, nothing be added to the pleasure and contentment of such a journey. I cannot entertain myself better than to meditate on such a congresse. He writes me word that you complain much of the cares of the world. I wonder you should be serious in such a complaint—a person so able and fit for businesse, that methinks it should be rather a diversion and pastime to you, than any burden or trouble. . . . I have sent enclosed a Latin letter to Tim Burrell ; I pray you be pleased to convey it to him with all convenient speed, and acquaint him that, if he be in health, he may with safety enough come up hither, the sicknesse much abating, and all the people growing well apace. For my own part, I doe not intend

\* William Campion, fellow-commoner of Trinity, 1655.

† Willughby and Ray started from Cambridge for Wales on May 8, 1662. Their tour is described in Itinerary III, *Memorials*, 1846.

long to reside in the Coll., and while I doe, I shall be soe full of businesse, that I shall have but little time to spend with my pupills. . . . I doe not expect long letters from you : a word or two shall suffice.

Mr. Blencowe very appositely adds that Ray was too honest and simple-minded to attempt to conceal from his friend the struggle which was going on in his mind between his conscience and his interest. It was a sad trial to him to give up his fellowship and to leave his beloved college. In one of his letters he says :—" If I doe concoct this subscription, it will be certainly contrary to my inclinations, and purely out of fear " ; and in relinquishing the living, we may well suppose that its vicinity to the Westmoreland mountains, with their sides covered with curious plants, their rocks green with ferns and mosses, and their dells and clefts gemmed with many a bright and beautiful flower, disturbed his mind and increased his regrets sadly.

It ended, however, in his refusal to subscribe to the Act of Conformity. Ray and, as it is said by the Presbyterians, two thousand others (though, according to Burnet, these numbers were much controverted), were deprived of their preferments. Before, however, this was finally done, he wrote to his friend from Black Notley.

### 11. *Danny Papers.*

I am now in Essex, where I intend to continue till Bartholomew Day be past. I am as good as resolved not to subscribe the declaration in the Act of Uniformity, and soe can expect no other than the deprivation of my fellowship. I must stay hereabouts to make up my accounts, and to dispose of my goods, till about Michaelmas. Many of our ministers in this county will be deprived upon this act, and those too the most able and considerable. . . . I shall now cast myself upon Providence and good friends. Liberty is a sweet thing. . . . I have not heard from you or of you any way since I took my leave of you at Danny ; and therefore, if this comes to your hands, I must entreat you to write to me. . . . I shall expose myselfe to much trouble and inconvenience by this refusall, but " Quicquid erit



superanda omnis Fortuna ferendo est.” I doubt not but I shall be, some way or other sustained, and it may be more to my satisfaction than if I should swallow the declaration, and continue still in Trinity Colledge. . . . It remains that I render you my most hearty thanks for your many late and former favours and kindnesses, and professe my deep sense of those ingenuous expressions and testimonies of love and good will you have always shewne me, “instinctu proprio, nullo meo merito.” . . .

Your most devoted servant, and debtor,

JO. WRAY.

## 12. *Danny Papers.*

BLACK NOTLEY.

Your countryman, Mr. Carre, is settled our neighbour here at Braintree.\* The living is but small, I believe; *viis et modis*, not worth one hundred a year. I hear he finds a great auditory, it being a large market-towne, only some like not well that he is so punctual in reading all the Common Prayers. I am told that the Bishop of London hath bound him in a great summe of money to read it all himselfe once a month, as the Act for Uniformity requires. I should be glad to hear from you. My prayers and good wishes shall always attend you: wherever I am, I shall glory in the title, sir, of

Your most devoted servant,

JOHN WRAY.

## 13. *Danny Papers.*

COLL. TRIN., Nov. 26th, 1661.

Sir,—Your cousin, Tim. Burrell,† arrived safe at Cambridge about a fortnight since. He brought me a letter from you, wherein you are pleased to invite me

\* Robert Carr, Fellow of Trinity, 1647, Rector of Braintree, 1662–76.

† Timothy Burrell subscribed £5 to Ray's monument according to an entry in his Diary “Erga monumentum Johannis Raii, tutoris olim mei apud Cantabrigenses, sed colendissimo, £5.” *Sussex Arch. Coll.*, iii.



into Sussex, when I shall have laid down the steward's office. My time is now ready to determine. In about a fortnight I shall give up my accounts, and then I hope to be at liberty, though I cannot certainly promise myself, for it may be they may continue me another yeare, which yet I desire not. I intend seriously to come and waite upon you at Danny, and spend some time there. I have one sad piece of news to tell you, that is the death of your, but especially my, very good friend, Mr. Pockley, at Dunkirk. His disease, as I hear, was a squinancy, which dispatched him in lesse than two dayes. I received not long since a letter from Mr. Willughby, wherein he condoles with you for your ague. Here are many still sick, some of quartane, among the rest, my pupill.

Your most devoted servant,

JNO. WRAY.

#### 14. *Danny Papers.*

[LONDON ?] April 28th, 1662.

. . . Since I returned hither, I have made a ride as far as Kingston Wood in quest of plants. There I discovered, what I never before saw in its pride, growing wild, *Herba Paris*, in many places, and not in Kingston Wood only, but also in Eversden Wood, in great plenty. I found also there, that sort of hairy wood-grass, of which I desired T. Burrell in my last, to preserve me a pattern, so that I now can ease him of that trouble. I found there also that *Muscus pennatus filicinus*, I first observed in Sussex. After you parted from us at Cuckfield, I discovered growing about there, *Anagallis aquatica surrector J. B.*; *Cardamine impatiens*, a different sort from that we sowed in our gardens (I found it all along the ditches as I rode to London); *Pilosilla siliquosa Thalii*, *Astragalus sylvaticus Thalii*, *Bulbocastanum*, *Gramen nemorosum hirsutum*, mentioned above, and another pretty sort of grasse; also a plant which I had often found in the North, and took

to be a kind of *Herminum*, but now I am assured it is called *Siderites loto obtuso*. I desire that, if you go to Hurston, you would view the ranunculus growing there, which I believe to be a distinct species from that which hath two sorts of leaves. . . . Our new master is gone to London, to the Westminster election; he pretends a great deale of good will to me, and promises faire to doe me all the service he can. He can stand me in stead in no way that I know of but in the matter of pupills, which I have not put myselfe out of. Possibly I may resume that trade about Michaelmasse next, when I shall have performed all my visits. . . .

### 15. *Danny Papers.*

[LONDON ?, May, 1662.]

Sir,—I wrote a prolix letter to you last week, and therefore may now seem somewhat importunate to set upon you with another; but being on the point of my departure into Warwickshire, in order to the intended expedition into Cambria Brittanny, and not knowing when I shall have the opportunity again to salute you, I hope you will excuse the present trouble. . . . At Middleton, Mr. Skippon meets me; I hope his company will not be unacceptable to Mr. Willughby; however, I know not how to reject him. I know he would have been a great deal better pleased with yours. I was in hopes to have heard from you before, being desirous to know something of the free school at Lewis, whether or not it be as yet disposed of, and to whom. I wrote to Mr. Hunt about it, who refers himselfe wholly to me, but I do not find him very inclinable to leave Pontefract; he finds so good acceptance and entertainment there, and the parishioners promise and undertake to procure him his patent, and to do for him anything else that is reasonable.

Having sent his respects and acknowledgments to all Mr. Courthope's worthy relations, particularly to the most honoured his mother, he says:—



I hope I may say it without ostentation, I am deeply sensible of, and most kindly affected with, every courtesie done me, every civilitie shewn me; this is the best quality that ever I perceived myself to have. Since my letter to you I have been out again, in pursuit of plants as far as Gamlingay; there I discovered some that I have elsewhere found in England, others that I never saw before. . . .

[*Here follows a long list of plants.*]

I found there one of those sorts of ferne which we observed about Danny, coming out at several seasons. I have a collection now of more than forty plants growing wild in Cambridgeshire, more than we have put down in our catalogue. In my last I acquainted you with the death of Dr. Martin, and now I can tell you who succeeds him in the deanery of Ely—Dr. Wellford, Master of Bennett College. In the mastership of Queen's, by virtue of a mandate from the R. Dr. Sparrow,\* the *Rationale* man, the junior Fellows would have chosen Mr. Patrick,† of my year, a deserving person, and one that wants nothing but yeares to qualify him for such preferments. The old and new University will never kindly mingle, or make one piece.

I am your most devoted and obliged,

JO. WRAY.

## 16. *Danny Papers.*

August 28th, 1662.

Sir,—I was much surprised at the unexpected and unwelcome newes of the death of that virtuous gentlewoman, your sister, and doe most passionately condole

\* Dr. Anthony Sparrow, Bishop of Exeter, and afterwards of Norwich, died in 1685. He was the author of the *Rationale of the Book of Common Prayer of the Church of England.* (B.).

† This was the celebrated Bp. Patrick. The account of this election, given in Chalmers's *Biographical Dictionary*, is, that Patrick was elected, by a majority of the Fellows, Master of Queen's College, in opposition to a royal mandate, appointing Mr. Sparrow; but the affair, being brought before the King and Council, was soon decided in favour of Sparrow, and some of the Fellows, if not all, who sided with Patrick, were ejected. (B.).



with you for so great a losse.\* Your letter brought me the first intelligence thereof. As for Tim Burrell, I have not heard from him since I departed Sussex. I will not refresh your grief (which by this time I suppose you have pretty well concocted) by recounting, from my little knowledge and observation of her, those excellent qualities and accomplishments which I judge could not but much endear her to yourselfe and the rest of her worthy relations. I know it must needs aggravate your trouble that she should be cut off “in ipso flore juventæ, præmaturo fato,” and, as usually falls out in such diseases, suddenly, before her friends were aware, or could arm themselves by consideration against the force and dint of so sad a blow, “improvisa siquidem gravius feriunt.” But all this notwithstanding, as philosophers, we must not indulge any passion beyond decorum, and as Christians we must not grieve like men without hope. The only use of sorrow is to attest our affections and demonstrate tendernesse of disposition, it being otherwise unprofitable to the deceased or ourselves. It’s a signe of good nature and very becoming a man (*Stoicis nequicquam reclamantibus*) to give way to a moderate expression of any good affection ἀγαθοὶ δ’ ἀριδάκρυες ἄνδρες;† but to permit it more scope than may serve to a good end, or to be transported by it, and disturbed in one’s businesse, is an argument of feminine weaknesse. As for myselfe, Jam præteriit Aug. 24 necdum ego Cantabridgienses reversus sum: jacta ergo est alea; sodalitio excidi sine postliminii spe ullâ, mihi istic amplius nec seritur nec metitur, victus aliunde quærendus est, tu tuique similes, afflictis rebus succurrite nostris, subsidium unicum, unicum estis solatium; me nondum incepti pœnitent, nec in posterum spero pœnitebit, illud potius dolendum, quod in tot laqueos timidus homuncio me jam jam induerim, unde evadendi nulla spes, nulla ratio superest. Video me

\* Courthope had two sisters, Dorothy and Jane, the reference is possibly to the second, who married Henry Bill and was buried at Lewes. See p. 38, note.

† Cf. Scholiast to *Iliad*: “Tearful men are ever noble.”

posse carere sodalitis idque æquiore quam speraveram animo. Calamitas ista hæc plus habet terroris in fronte quam in recessu mali. Splendide an obscure vivam mihi perinde esse incipit, verum quid si subducant sese paulatim qui amicissimi crediti sunt; si deserant extorem; si humilitatis nostræ vos pudeat, si (quod Naso olim quæritabat). “In mediis lacerâ puppe relinquare aquis”? Non demittam animum, utcumque quoad possum annitar ut sit in omnem eventum bene præparatum pectus.\* Et quamvis nihil tale subvereor aut suspicor quidem (nefas id esset de viris tantæ fidei, pietatis, virtutis, tam de me semper optimè meritis) attamen si id præter omnem spem et expectationem acciderit, (liceat hoc mihi fingere et imaginari), dabo operam ne tanto oneri succumbam penitûs divinâ innixus providentiâ. Supremi Patris familias curâ, “me virtute meâ involvam, piamque pauperiem sine dote quæram.”†

But I will not be too liberal of my Latine; indeed you had not had so much, but that I am now *vacuus negotiis*. You are pleased to put a compliment upon me concerning my company, which I cannot imagine, from the late experience you had of it, can any way be desirable to you; but yet I had determined to have taken up my quarters with you the best part of this winter, after that I had settled my affairs, and disposed of my goods at Cambridge; but Mr. Barnett‡ coming over hither on purpose to see me, and making a strong invitation to Bacton, I could not avoid to engage myself to wait upon him, and spend some time with him this winter, though I must confesse, were I free, I should in many respects prefer Danny. . . . I pray present my service to all your honoured relations, but especially Τῇ πᾶντι. On Saturday next I set forward for Cambridge, where you shall again hear from me.

Sir, your obliged servant and humble orator,

JO. WRAY.

\* Horace, *Odes* ii, 10.

† Adapted from *Odes*, iii, 29. (J.U.P.).

‡ Perhaps Sir Robert Barnham of Bocton in Kent, mentioned on p. 117. There was, however, an Andrew Barnett, sizar of Trinity, 1646, ejected from rectory of Rodington, Salop, 1662. Practitioner of physic.



17. *Danny Papers.*

CAMBRIDGE, Sept. 4th, 1662.

Sir,—Partly businesse and partly the weather hindering me from delivering this into the post, I brought it hither in my pocket, and have something now more to adde. . . . I find not many in this University that have refused to subscribe, in all twelve Fellows, whereof three are of Emanuel, and the rest—two of St. John's, of our College not one besides myselfe, two of Magdalen, one of Bennet, two of Pembroke Hall, one of King's; one Master, Dr. Dillingham, of Emanuel College.\* I am now dispatching here, and shall be quite removed by the end of the next week. I had this morning a motion made to me of a preferment in Suffolk—such an one as I am capable of, that is, living with a gentleman in his house (one Bacon, by name); no duty at all enjoined; the terms £40 per annum: but I shall balke it, though a very good offer, because I have the designe of travelling hot in my head. My tutor,† T. B., and the rest of my friends here, are very well, and very jolly; Mr. Senior‡ now is quite routed, yet the face of things not much altered.

Ray, however, did not “balke” the engagement altogether; he went to Friston Hall, the seat of the Bacons, and remained there about six months, and several letters were written from thence to his friends at Danny.

18. *Danny Papers.*

FRISTON HALL, Nov. 3rd, 1662.

Sir,—It hath not been my happinesse of a long time

\* Emanuel College was a thoroughly Protestant, not to say Puritan, College. It was founded in the reign of Queen Elizabeth by Sir Walter Mildmay, as a refuge for those who adhered to the new faith. Dr. Dillingham wrote a life of the founder in good readable Latin. (B.).

† Dr. Duport, Regius Professor of Greek, and afterwards Master of Magdalene College. “The pious and learned Mr. Brokesby,” says Dr. Derham, “informed me, that in a discourse with Dr. Duport, reckoning up several gentlemen of worth that the Doctor had been tutor to, the Doctor said the chief of all his pupils were Mr. Ray and Dr. Barrow, to whom he esteemed none of the rest comparable.

‡ Thomas Senior, lecturer at Holy Trinity, Cambridge, ejected 1662.



to hear from you, or of you. I hoped to have seene you at London, when I was last there, on my returne out of Kent. I desire much to know what was the result of your conference with Mr. Willughby, for I presume you obeyed his summons to give him a meeting, viz., whether you consented to embarke in the same bottome with him the next spring? I suppose he then acquainted you that I have now explicitly obliged mysele by promise to accompany him, if he really desire it, and not in compliment only. . . . Now, sir, to give you some account of mysele. I have lived about three weeks in the family of Mr. Thomas Bacon, at Friston Hall, near Saxmondham, in Suffolk. I am deceived if I did not formerly acquaint you with my invitation hither, and the quality of my employment. I have been very kindly entertained and civilly treated here, and may have my own terms if I will consent to stay. But I have not, nor will I engage mysele any longer than till Annunciation next, that I may then be free to wayte upon Mr. Willughby.

On Saturday last I rode forth to Aldburgh, to see those famous Sea Pease, noted by our historians and herbarists to grow between Orford and Aldburgh, upon the shingle or beach of stones by the seaside. Some I found, not far from Aldburgh, growing by batches upon the stones; but about six miles further southward, at the extremity of that long bank of stones which runs from Aldburgh towards Orford, at least seven miles into the sea, near the haven's mouth, is this famous and remarked place, where (as all the people hereabout affirme, and I believe) they cover the whole shingle for half a mile together. So that I cannot guesse the yearly crop of pease to be lesse than 100 combs or half-quarters. For a full and particular description I referre you to Parkinson, where also you have a figure of them; only I do not find in them now ripe that bitterness he mentions; indeed, to me and others they seem not so bitter as our common vetches, though they are smaller, which is, I conceive, the reason why they are altogether

neglected by the country people hereabout. When they are ripe they are of a darke olive colour, not round, but shrunke or crumpled like our ordinary gray pease. Some of the stalkes and leaves still continue green, but the most were seare and withered, abundance of pease still hanging upon them. I wonder, though men neglect them, that pigeons and other wild fowls should not devoure them.\* . . .

### 19. *Danny Papers.*

FRISTON.

. . . Nothing is to me more pleasant, in this retirement and distance from my former friends, than to heare from, and to write to them. I cannot entertain my time more pleasantly, nor spend my thoughts upon a more gratefull subject. . . . I have now spent about halfe the time I have to bestow in this place, and I am not sorry for it, not because I mislike any usage or entertainment here, that is unexceptionable; nor could I hope to be treated more civilly, or gain more kindnesse and respect anywhere, but because I am somewhat overcharged with businesse of another nature than what I should spontaneously and of my own instinct pursue. I have consented to bestowe upon the family a short discourse in Divinity every Sunday. Some reason they have to desire it of me, their pastor being a weak old man, somewhat below the elevation of yours, and his sermons are jejune. He likewise exactly repeates the same words in the afternoon, without addition or alteration, daily. The young gentleman with whom I am charged hath very good parts, and a quick wit. He hath broken into some extravagancies

\* A correspondent in *Notes and Queries* has kindly communicated the following information with respect to these peas: "The plant is not confined to that locality, but is said to grow at Hastings, Rye, and Pevensey, in Sussex; near Lyd and Walmer Castle, Kent; Sandown Beach, Hampshire; near Penzance; in Lincolnshire, Shetland, and Ireland, and probably in many other places. Ray and Gerard called the plant *Pisum maritimum*; Linnæus, *Pisum maritimus*; but modern botanists have removed it to the genus *Lathyrus*, and it is now called *Lathyrus maritimus*."—No. 98, 2nd Series, Nov. 14th, 1857.



at Cambridge, which caused his father to take him home : he is impatient of labour, and indeed his temper will not admit long study. I must needs with gratitude acknowledge and commend his kindnesse, civility, and respectful carriage towards me, whom he studies, as much as he can, to please, gratify, and oblige. I busie myselfe in enquiring out and describing such birds as frequent the channel near us. I have gotten some and cased them, among the rest a bittern and a curlew, and a yarwhelp ; the fourth was like a duck, with a bill hooked at the top, for which we had no name. The yarwhelp\* is a name that I never read or heard of before or since, and therefore imagine it was coined by William Bates.† . . . I long since received a letter from Mr. Willughby, wherein he assures me of his firme adherence to his resolution for travel, and that he hath almost conquered all opposition of his friends, and made his way clear ; he despairs of your company, and relies upon me, and I intend not to frustrate him. I am told your house's old master, the Earle of Norwich,‡ is dead ; it falls out well for Mr. Willughby (as I remember), his father paid him a considerable annuity out of the estate. If you be resolved to sell Danny, I wish you may meet with a chapman to your content that will come up to your terms, which I presume are not unreasonable. I should be glad to hear of the health and welfare of your relations known to me, especially the much honoured your mother, not omitting the little child : my humble service to them all, and thankes for their civilities and kindnesse when I was in Sussex. . . .

[JOHN RAY.]

In the same collection are two letters from Mr. Willughby, the first alludes to their projected travels and is undated :

\* *Limosa lapponica*, the bar-tailed Godwit, from its cry on taking wing.

† Perhaps W. Bates, the theological author (*D. N. B.*)

‡ George Goring, Earl of Norwich owned Danny.



## MR. WILLUGHBY TO MR. COURTHOPE.

Sir,—I was very glad to heare from you, and that you have any inclination towards travelling. I doubt not but you have friends, as your Uncle Burrell and others, who would willingly undertake the trouble of looking to your affaires in your absence; ours cannot so well be settled at Wollaton, but something will be lost; but that does not move me at all, when I consider that time and youth are not to be bought, and that we are sufficiently secured against poverty, as you are too. It would be hugely inconvenient, in a great many respects, to defer it halfe a yeare. If you cannot possibly despatch to goe with us, I hope you will come to us. If you will meet us at London at the end of March, we will mutually agree upon the time and place. The King of France's designes will not at all obstruct us, there being enough of the world that wont be in his power to disturbe.

Your faithful and affectionate friend,

Ff. W.\*

The references in these two letters show that Blencowe was in error in stating that Ray was their recipient.

## MR. F. WILLUGHBY TO MR. COURTHOPE.

LONDON, May 8th [1669 ?].

Sir,—Your very kinde letter has renewed a dying friendship, and I am much beholden to you, that you take such care to know my concerns. God has blest us with a boy and a girle worth both the Indies,† and I hope there is a plentiful ovarium left still, and not only *familia*, but *res familiaris aucta*, *æs alienum extinctum*, and all things have prospered beyond our deserts: this great glut of mines having caused a great losse in our coalworkers being but a small matter. I heartily condole the losse of your young ladie, who would have claimed beauty and wit as her inheritance from both sides; you cannot be too carefull and prudent in preventing all premature births, of which the jumbling of coaches is the most common cause amongst the better sort. I shall expect, about seven months hence, that you will favour me with the newes of an heir, and that you will take care that he use his parts better, and be a greater virtuoso than his father,

\* Blencowe read "J. L. W." in error. See p. 14.

† Afterwards Sir Francis Willughby and Cassandra, Countess of Cavendish.

though it will be no small matter, *prodire tenus*. With my humble service to your virtuous ladye and relations,

I am your faithfull servant,

F. WILLUGHBY.

Willughby died, after a short illness on July 3, 1672, leaving Ray one of the guardians of his three children; he bequeathed him an annuity of £60. In this capacity, and as literary executor to his friend, Ray resided at Middleton.

## 50. *Danny Papers.*

MR. RAY TO MR. P. COURTHOPE.

MIDDLETON, Jan. 17th, 1673.

Sir,—I return you many thanks for your letter which I received last week, and doe most gladly embrace the proffered correspondence. The news of the death of Mr. Monk,\* I received from Mr. Burrell a good while since; I know the losse of so good a friend and near relation must needs trouble you not a little, besides that, it was like to involve you in a great deal of businesse, and bring the whole care and burthen of that family upon you. The sudden death of Mr. Latchford is indeed to me a very strange thing, especially if he went to bed well, instances of that nature being very rare. The other newes your letter imparts, viz., that God hath sent you a young son, and likewise given you hopes of enjoying him, was to me very welcome. I doe really rejoyce with you, and pray God grant you many more. I was bold to dedicate a small trifle † to you, which I printed chiefly to gratifie your cousin, Thomas

\* This was probably one of the Monks of Houston, in West Sussex, a gentle family. I do not find his relationship to the Courthopes. (B.).

† This was his *Collections of English Words*—provincialisms, which he had picked up in his travels in different counties. It is usually appended to his *English Proverbs*, a well-known book. This small work was the first attempt made to gather up the old and vulgar English, which lexicographers had ignored or neglected. It seems to have become so popular as to have required a second edition the following year, 1674. Ray was upon terms of friendship with many members of the Burrell family. At the end of his work he gives an account of the ironworks of Sussex, furnished him by his honoured friend Walter Burrell, of Cuckfield, Esq.—*Sussex Arch. Coll.* ii, 200.



Burrell, and at his instance. He writes me that they have sold very well, and that he had disposed of almost the whole impression, which, for his sake, I am glad of. I am at present, and have been a twelvemonth, almost wholly engaged in reviewing and preparing for the presse, Mr. Willughby's *Ornithology*, for which his relict is content to be at present at the charge of engraving brasse figures, though I doubt not that the work, when published, will reimburse her. I believe we shall hardly get it abroad this twelvemonth yet. The death of Mr. Willughby hath cast more businesse upon me than I would willingly have undertooke. I love my ease too well ; but he hath given me sufficient encouragement, by settling upon me an annuity for life, of £60 per annum. I am like now to set up my staffe here, at least so long as my old lady lives, who returns her service to you, as also does Mrs. Winstanley, who, since her husband's death, lives here with us. A friend of mine, Mr. Martin Lister, of York, hath desired me to procure him a small parcel of the ironstone of Sussex. I should thinke myselfe beholden to you, if you would get and send up to London to Mr. Burrell such a parcell, and I shall send him directions by what means to send it to York ; but if you cannot do it without trouble, I will not be importunate, but had rather be without it. Please to tender my very humble service to your much-honoured mother, Mr. Oliver and Mrs. Oliver, Mr. Bill,\* Mr. White and his lady,† your honoured sister, Sir John and my Lady Stapley,‡ and the rest of your honoured relations known to me as though I had named them, but principally

\* Mr. Bill was Henry Bill, Esq., of Reigate. He was son of John Bill, king's printer to Charles I, and married Jane Courthope, Peter Courthope's sister. Mr. Bill was buried at Laughton, where there is an inscription to his memory. (B.).

† Dorothy, wife of Dr. White, was another sister of Peter Courthope. Dr. White practised physic at Lewes, and his daughter or grand-daughter, the heiress of the family, was married to John Bridger, Esq., of Coombe, and was the mother of Sir John Bridger, the maternal grandfather of Admiral Sir H. Shiffner, Bart. (B.).

‡ Peter Courthope's wife was Philadelphia, daughter of Sir John Stapley, of Patcham, Bart.



to the puerpera, to whom I heartily wish a good beginning and the comfort of many a fair son and daughter of her own bringing forth and breeding up. And so I rest,

Your most devoted servant and orator,  
JOHN RAY.

And here, observes Mr. Blencowe, the correspondence ends with Mr. Courthope. The good wishes of Ray expressed in this letter were not realized. One only child, a daughter, lived, and she married the son of Mr. Courthope's old friend and chamber-fellow, alluded to in a former letter to Mr. Campion, and carried the property and mansion of Danny into that family.

In 1674 Ray dedicated his *Collection of English Words* to Peter Courthope. A solitary letter from Courthope to Ray dated Danny May 15, 1676, was seen by Derham about 1718, and is noted in his list of letters. Derham's abstract runs :

“ Excuse for not giving to Trinity Col[lege]. Kath's Hall Mr. Ray's former Col[lege]. Thank for . . . . of Mr. Wil[lughby's] *Ornithology*.

*Copy of Mr. Ray's ans[wer] on ye back.”*

## III.

## RAY—WILLUGHBY CORRESPONDENCE.

It was hoped that some of Ray's letters to Francis Willughby might have been preserved at the family seat at Wollaton, but apparently when Dr. William Derham compiled his *Life of Ray* in 1718, all personal letters were sent to him by Cassandra, daughter of Francis Willughby the naturalist, and were never returned. In any case no trace of such letters was found by the Historical Manuscripts Commission when the Middleton papers were reported on. They did, however, find a small 4to volume with notes by Francis Willughby, the result of an examination of old family papers by himself and John Ray. The title was "Memoirs and observations taken out of old muniments, videlicet-deeds, fines, accounts, court rolls, and all sorts of old writings which were found the most of them either at Wollaton or Middleton chiefly concerning pedigrees, marriages, titles of land, purchases & sales, sutes in all courts of the familie of the Willughbies."

The abstracts from the time of Richard II to Edward IV are neatly written by the hand of Ray, and there is also a transcription of a charter of King John of 1199 A.D. by him.

## IV.

## RAY AND THE ROYAL SOCIETY.

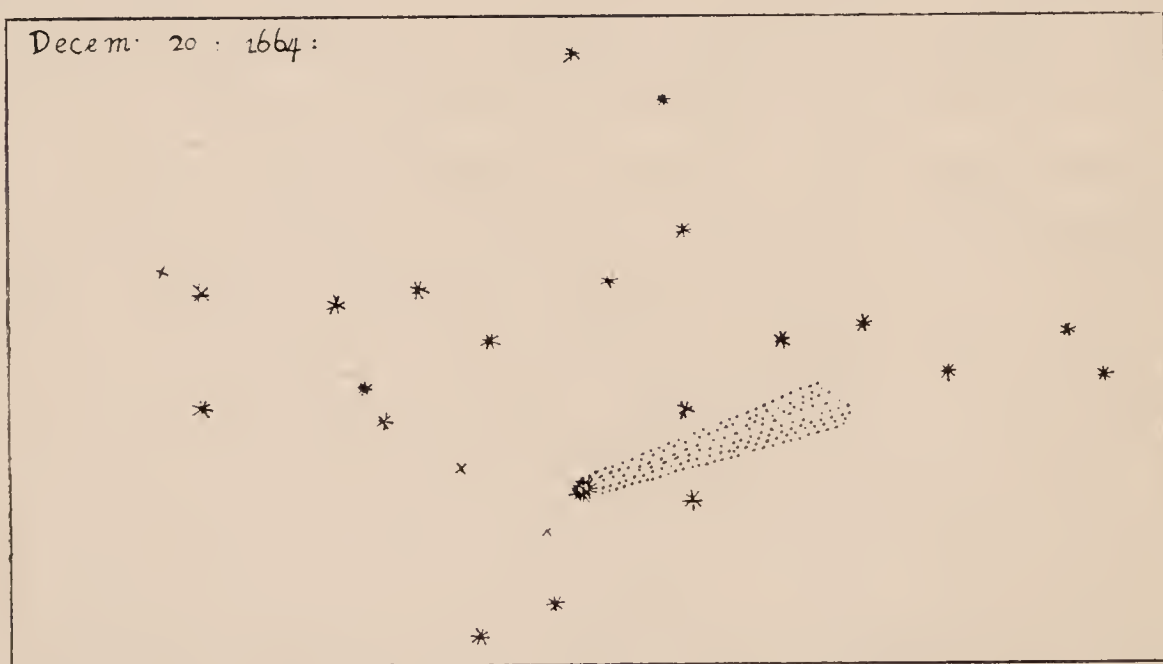
The *Philosophical Transactions of the Royal Society* preserve the earliest references to Ray's interest in scientific matters other than his botanical studies. His pupil, Sir Philip Skippon, who had accompanied him in 1661 on a second botanical tour in the north of England, continued to write him letters for several years. Seven of these letters are among the Ray Letters in the Botanical Department of the British Museum, and were partly printed in the volume of Correspondence issued by the Ray Society in 1848. A part of a still earlier letter of Skippon to Ray, dated January 22, 1662, appeared a few months after the death of the latter, in the *Philosophical Transactions*, vol. xxiv. It dealt with a case in which the bones of a human foetus had been voided through an imposthume in the groin, and was communicated to the Society by Ray's literary executor and neighbour, Mr. Samuel Dale. In 1663, Wray, as he then spelt his name, started for the Continent, in company of his second pupil, Francis Willughby, making the grand tour that has become historic; and again we owe to the Royal Society a record of Wray's astronomical interests, dating from



those first years of his scientific career, though not published until after his death.

*Observations made at Rome, by the late Reverend Mr. John Ray, of the Comet which appeared Anno 1664. Communicated to the Publisher by Mr. Samuel Dale.*

*December the 20th 1664.* S. N.—About three of the Clock this Morning, I observed the *Comet*; it was in the Constellation of *Hydra*, not far from the Foot of *Crater*. It appeared about the bigness of a Star of the first Magnitude, but nothing so lucid and bright. It had a very long Tail, which pointed almost directly towards the Heart of *Hydra*: The Tail shewed somewhat like Rays of a Candle burning in a Mist: The Figure of it was Conical; the Length of it 5 or 6 Degrees; the Breadth at the Base not above a Degree and half. The Body of this *Comet* was about 3 Degrees to the South East of the most Southerly Star in the foot of *Crater*; it stood very near in a Right Line with the two lowermost Stars in the Foot of *Crater*, which are common to it and *Hydra*. See the [7] *Figures* [three of which are here reproduced].



*December 21.*—In the Morning, about the same Hour, it was removed about a Degree and half from the Place where it stood, Westward, and a little to the South. The Tail pointed still towards the Heart of *Hydra*, and appeared 10 Degrees long at the least.

*December 22.*—At the same time it was removed from the

Place where it stood the Day before, to the same Point, and about the same distance as the Night before. The Tail of it still pointed to *Cor Hydræ*, or a little thought above it, as the two former Days, and was rather longer than shorter: It also, to my thinking, appeared brighter and larger; the Body of it being bigger then any Fixt Star, except *Sirius*.

*December 23.*—It was removed to the same Point, and about the same Distance as the Day before; the Tail of it was as long as ever, and the *Comet* brighter. The Tail pointed almost directly to *Cor Hydræ*.

*December 24, 25, 26.*—All these 3 Nights were Cloudy, so that I could make no Observations.

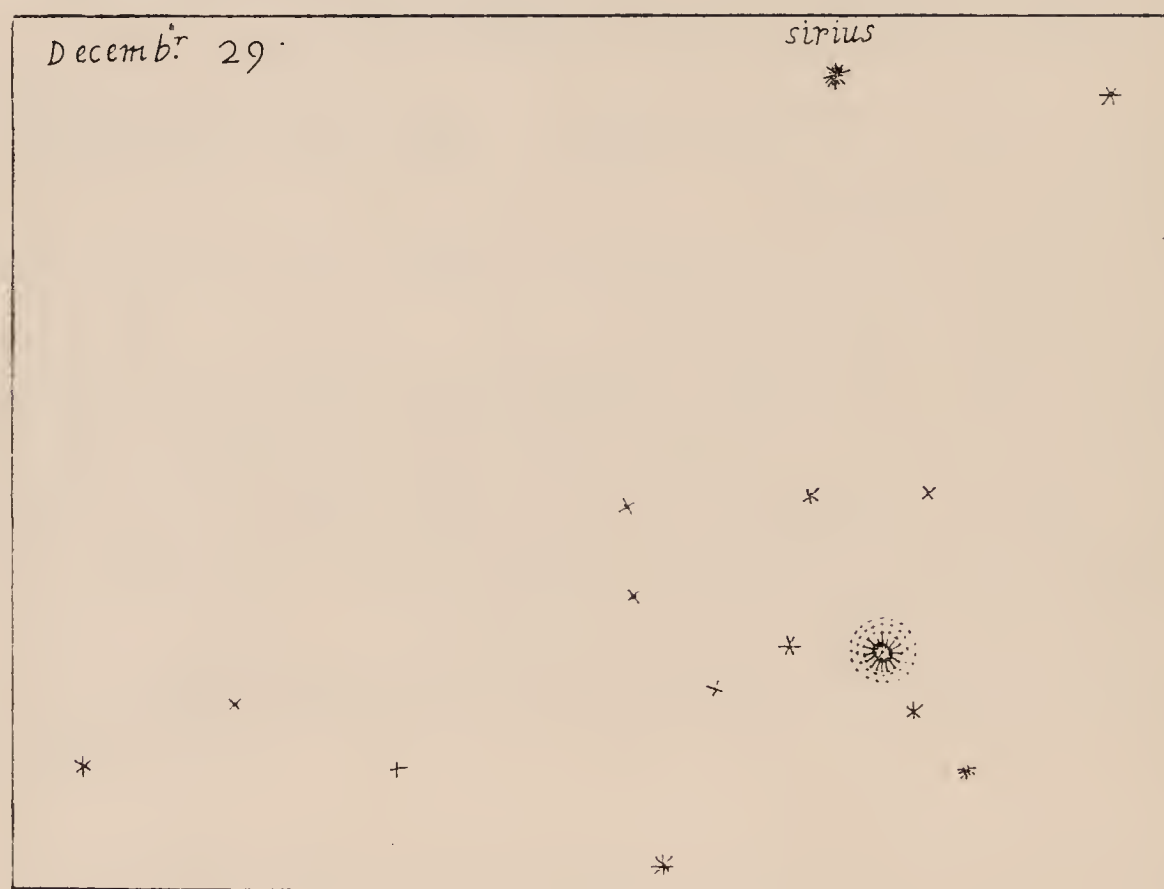
*December 27.*—We found it strangely removed from the Place where it was: It was still Westward, and a little to the South, as before. The Body of the Star was still brighter, and the *Cauda* about it greater, and more bushy, and yet as long as before; it pointed almost directly against *Canis major*. The Body of it was among the Stars of *Argo*.



*December 28.*—The same time it was removed above 2 Degrees towards the same Point, and come within 4 or 5 Degrees of the most Eastern Stars in the bright Triangle in the Buttocks of *Canis major*. The *Moon* shining we could not so well judge, either of the Bigness of the Body, or the length and Bushiness of the Tail.

*December 29.*—It was strangely removed, and got before, not the Eastern Star only of the mentioned bright *Triangle*, but also the most Northern. I think, at least, in this last 24 Hours,

it had moved 4 Degrees. The *Moon* shining bright, the Tail could not well be observed, yet still it seemed to point directly to *Canis minor*. [*Philosophical Transactions*, xxv, pp. 2350–2, 1707, and the original manuscript, without the figures, is MS *Sloane* 3323, f. 188.]



The same comet was observed at Lisbon by Consul Maynard. Writing to Sir R. Fanshaw under date Dec. 22, 1664, he noted: "At this time here appears a prodigious comet, which hath been seen these 12 nights in the constellation of Hydra, betwixt Corvo and the Pot, in  $24^{\circ}$  S. latitude, and comes upon the meridian about half an hour past 5 o'clock in the morning, the influence of which is extremely feared in this country. You will do me a favour to let me know how it appears with you."\*

On October 31, 1667, John Wray, M.A., was proposed by Dr. Wilkins as a candidate for admission to the fellowship of the Royal Society, and on November 7 following he was elected and admitted. His signature appears on the roll of fellows on the same page as those of his friend Peter Courthope and of John Locke. The

\* Heathcote MSS. *Historical Manuscripts Commission*, 1899, p. 171.



earliest reference to any contribution by him to the proceedings of the Society was two years later, when at the meeting on June 10, 1669, Mr. Oldenburg produced the oft-quoted paper on the motion of sap in trees. It was printed on June 21, 1669, with the title :

*Experiments concerning the motion of the Sap in Trees, made this Spring by Mr. Willugby and Mr. Wray Fellowes of the R. Society : and communicated to the Publisher of the Inquiries touching that subject in Numb. 40.*

1. In *Birch*-trees, the sap issues out of the least twigs of branches, and fibres of roots, in proportion to their bigness.

2. In all trees the gravity promotes the bleeding ; so that from a branch or root, that tends downward, there will issue a great deal more sap than from another of the same bigness in a more erect posture.

3. Branches and young trees cut quite off when they are full of sap, and held perpendicularly, will bleed, as we experimented in *Willow*, *Birch*, and *Sycamore* : and if you cut off their tops, and invert them, they will bleed also at the little ends. Hence one may conjecture, that the narrowness of the pores is not the sole cause of the ascent of the sap ; for, water that hath ascended into little glass-pipes, will not fall out again by its own gravity, if the pipes be taken out of the water.

4. Roots of *Birch* and *Sycamore* cut asunder will bleed both ways, that is, from that part remaining to the tree, and from the part separated ; but a great deal faster from the part remaining to the Tree. But in a cold snowy day, the root of one *Sycamore* we had pared, bled faster from the part separated ; and ten times faster than it did in warm weather before.

5. In *Birches* the sap does not issue out of the bark, be it never so thick, but as soon as ever you have cut the bark quite through, then it first begins to bleed.

6. The bark being quite pared off, above an hand's-breadth round, about several *Birches*, did much abate the bleeding of those trees above the pared places, but did not quite stop it.

7. The sap doth not only ascend between bark and tree, and in the prickt circles between the several coats of wood ; but also through the very body of the wood. For, several young *Birches* being nimbly cut off at one blow with a sharp

axe, and white paper immediately held hard upon the top of the remaining trunk, we stuck down pins in all points of the paper as they appeared wet; and at last, when most of the paper became wet, taking it away, but leaving the pins sticking, we found them without any order, some in the circles, and some in the wood between. And to confirm this further, we caused the body of a tree to be cut off aslope, and then cut the opposite side aslope likewise, till we brought the top to a narrow edge; ordering the matter so, that the whole edge consisted of part of a coat of wood, and had nothing of a pricked circle in it, which notwithstanding, the sap ascended to the very top of this edge, and wetted a paper laid upon it.

8. To find out the motion of the sap, whether it ascended only, or descended also, we bored a hole in a large *Birch*, out of which a drop fell every 4th or 5th pulse. Then, about a hand's breadth just under the hole, we saw'd into the body of the tree, deeper than the hole: whereupon the bleeding diminished one half; and having sawed just above this hole to the same depth, the bleeding from the hole ceased quite; and from the sawed furrow below decreased about half; and it continued bleeding a great while after at both the sawed furrows, the hole in the middle remaining dry. We repeated this with much the like success upon a *Sycamore*.

9. Some trees of the same kind and age bleed a great deal faster and sooner than others; but always old trees sooner and faster than young.

10. A wound, made before the sap rises, will bleed when it doth rise.

11. While we were making these experiments, the weather changed from warm to very cold; whereupon the bleeding in the *Birches*, which begun to abate before, ceased quite: but all the *Sycamore* and *Walnut*-trees, we had wounded, bled abundantly, (some whereof bled not at all, and those that did, did so but slowly) and so continued night and day, when it froze so hard, that the sap congealed as fast as it issued out. The cold remitting, the *Birches* bled afresh, the *Sycamores* abated very much, and the *Walnut*-trees quite ceased.

12. We pierced two *Sycamores* on the north and south sides, and both of them from equal incisions bled a great deal faster from the north sides, than the south; which is consonant to the preceding experiment.

13. We set several *Willows* with the wrong end downward, and cut off several *Bryars* that had taken root at the small



ends. This 29th of *May* [1669] the *Willows* have shot out branches near two foot long; and from the top of the sets, which were a yard high, the *Bryars* have also grown backwards, from that part which we left remaining to the roots at the lesser ends; they have great leaves, and are ready to flower.

[*Philosophical Transactions*, iv, No. 48, pp. 963–5.]

After this paper had been read and ordered to be registered, Mr. Oldenburg was desired to request the authors, as they had opportunity, to try some experiments to find whether there be any circulation of the juice in vegetables as there is of blood in animals.

In the meantime naturalists occasionally communicated their observations to Wray, who in turn forwarded them to the Society. “Sir, I can deny you nothing,” wrote one of them, “and you may doe what you please with the Notes I send you. You would know of me (you say) what I have observed concerning the *Odd Turn* of some *Shell-snailes* with us in England, and the *Darting of Spiders*. . . .” The complete letter was printed by the Society under the title, *Concerning the odd Turn of some Shell-snailes, and the darting of Spiders, made by an Ingenious Cantabrigian and by way of letter communicated to Mr. I. Wray, who transmitted them to the Publisher for the R. S.\**

Research on the flow of sap was continued by Dr. Tonge† and by Martin Lister, who added an account of observations made by himself at Nottingham on the Bleeding of the Sycamore in winter, with “some hopes of improving the notion of Winter-bleedings, so happily discover’d by Mr. Willughby and Mr. Wray.” His experiments were published in the *Philosophical Transactions* for Feb. 20, with “*An Extract of another Letter written by the same Gentleman, Mr. Wray, to the publisher, of Feb. 8th, 1670–1, containing some Experiments about the Bleeding of the Sycamore, and other Trees; as also, a considerable Note of Pliny, about the Mulberry-Tree.*”

\* *Philosophical Transactions*, No. 49, July 19, 1669, pp. 1011–16.

† *Phil. Trans.*, pp. 2070–2077.



From this title it might be supposed that Ray was the author of the paper. This, however, was not so, a fact emphasized in a manner which must have been unique in the history of the Society, namely by the reprinting of the entire paper in a later number of the *Transactions* (p. 2120) with a correct attribution to Lister, to whom on March 11, 1670–1, Oldenburg wrote “Mr. Willughby and Mr. Wray have not yet sent us any thing relating to ye bleeding of ye Sycamore. When they doe, you shall quickly know, though I doubt not, but you will have them as soon as we.”\*

Mr. Francis Willughby, with whom Wray was then living, wrote two other letters to the publisher of the *Philosophical Transactions*, one on August 19, 1670, from Astrop, and one on September 2 from Middleton, *Containing his Observations on the Insects and Cartrages*, described in a paper produced before the Royal Society by Dr. Edmund King on July 14. Willughby had repeated Dr. King’s discovery of maggots of an insect of the Bee-tribe wrapped up in leaves. “Beginning to unfold some of them, Mr. Wray immediately judged them to be made up of pieces of Rose-leaves, and called to mind that this very spring a worthy friend of his, Mr. *Francis Jessop*, brought him a Rose-leaf, out of which himself saw a Bee bite such a piece, and fly away with it in her mouth. Whereupon searching the Rose-trees thereabout, we found a great many leaves, with such pieces bitten out of them. . . .”—*Phil. Trans.*, v, p. 2101.

Willughby’s letter is followed by *A Confirmation of what was formerly printed in Numb. 50 of these Tracts about the manner of Spiders projecting their Threds : communicated by Mr. John Wray to the publisher :†*

Concerning the manner of Spiders projecting their threads, I received the following account from Dr. *Hulse*, from whom (to do him right) I must acknowledge, I had the first notice of this particular, which was not long after communicated to me

\* MS. *Lister* 34, *Letter* No. 6.

† Ray’s original MS. is No. 11 in the Letter Book of the Royal Society.

by another ingenious friend [Dr. M. Lister], whose letter I formerly sent you to be imparted to the *Society*. Nor is it any great wonder, that inquisitive persons, applying themselves to observe and consider the same subjects, should make the same discoveries.

“I have (saith he) seen them shoot their webs three yards long before they begin to sail; and then they will, as it were, fly away incredibly swift. Which *phænomenon* doth somewhat puzzle me; seeing oftentimes the air doth not move a quarter so fast as they seem to fly. Mostly they project their threads single, without dividing or forking at all to be seen in them. Sometimes they will shoot the thread upward, and will mount with it in a line almost perpendicular; and at other times they project in a line parallel to the plain of the horizon, as you may often see by their threads that run from one tree to another, and likewise in chambers from one wall to another.

“I confesse, this observation at first made me think, that they could fly; because I could not conceive, how a thread could be drawn so parallel to the horizon between two walls or trees, as abovesaid, unless the spider flew through the air in a straight line.

“The way for forking their threads, is expressed by the following figure :



“What reason should be given of this dividing, I know not, except that their threads, being thus winged, become better able to sustain them in the air.

“They will often fasten their threads in several places to the things they creep upon: the manner is by beating their tails against them as they creep along, which may be understood by this line :



“By this frequent beating in of their thread among the asperities of the place, where they creep, they either secure it against the wind, that it be not easily blown away; or else whilst they hang by it, if one stick breaks, another holds fast, so that they do not fall to the ground.”

To this *Confirmation* is appended an editorial note



stating that the phenomenon of the darting of threads had been observed both by Lister and Hulse independently of one another.

Seven letters written by Wray, as he still spelt his name, to the Secretary of the Royal Society, Henry Oldenburg, are preserved in the Society's archives. The earliest of the series, dated Jan. 5, 1670, we are now able to print, with the kind permission of the Council of the Royal Society :

**39.** *Royal Society Letter Book*, No. 10.

Sir,

What I now send you concerning the juice of Pismires, I received not long since from Dr. Hulse & Mr. Sam. Fisher ; & you may, if you think it worthy their notice, communicate to the R. Society ; & publish or suppress as you see cause. Aug. 10 last past concerning this juice Dr. Hulse sent me the following observations. “ Lately (saith he) consulting *Langham's garden of health*, I met with this passage. ‘ Cast the flowers of Cichory amongst a heap of Ants, & they will soon become as red as blood.’ [N.B.—Langham was not the first that made or published this observation : I find it delivered by Hieronymus Tragus *Hist. stirpium* lib. 1, cap. 91. *Naturæ miraculum in hoc flore observare licet ; Si quidem cumulo formicarum abditus, cœruleum colorem in rubeum mutat, ac si terrore illarum erubesceret.* & before him by Otho Brunfelsius, as Joannes Bauhinus takes notice.] I presently got some Cichory flowers and made the experiment, & find it to be true that he saith ; only he takes no notice of the manner how the flowers come to be so stained, which therefore take as follows. Bare an Anthill with a stick, and then cast your flowers upon it, and you shall see the Ants creep very thick over them. Now as they creep, they let fall a drop of liquor from them, & when that chanceth to light there you shall have in a moment a large red stain. Sometimes they will be a pretty while before they discolour them,



& at other times they will do it suddainly. At the first I guessed that being vex't by stirring their hill, they might thrust their stings into the flowers, and through them convey that sharp liquor. But by bruising them and rubbing the expressed juice against the flowers I find they will be equally stained. It's a thing well known, that Ants, if they get into people's clothes & so to their skin, will cause a smart and tingling as if they were netled, which I conceive is done by letting fall the forementioned corrosive liquor, rather than by stinging. To what sort of liquor to referre this juice I know not. I drop't spirit of salt & oil of sulphur upon the flowers but they would not at all discolour them. I likewise put salt of Tartar upon them, and drop't thereon a little spirit of salt, which caused a sufficient fermentation, but did not prevail to change the colour of the flowers in the least. This observation holds true not only in Cichory flowers, but also in Larkspurs, Borage flowers & I suppose all others that are of a blew colour. It were worth the while to try, whether that sharp liquor, which Mr. Hook saith is in the stings of Bees, if it may be got out by thrusting them into the leaves of flowers, will not cause a stain." So far the Doctor. Upon reading these passages, I called to mind an experiment which some years since Mr. S. Fisher of Sheffield had made me acquainted with, viz. If with a staffe or other instrument you stir a heap of Ants, (especially Horse-Ants) so as to anger them, they will let fall thereon a liquor, which if you presently smell to, will twinge your nose like newly-distilled spirit of vitrioll. Considering this, and likewise that a few drops of the oil or spirit of vitriol will soon turn the bluish syrup of violets into a bright red ; & as I am credibly informed the juices & tinctures of any other flowers or fruits of that or the like colour, I was easily induced to think, that this juice of Pismires might be of the same nature with the oil of vitrioll & other acid spirits, (which have in the forementioned respects the same effects with that oil) : and thereupon I sent to enquire of Mr. Fisher what trialls he had made

of it, who returned me this following account. A weak spirit of Pismires will turn Borage flowers red in an instant ; vinegar a little heated will doe the like.

Pismires distilled by themselves or with water yield a spirit like spirit of vinegar or rather like the spirit of *viride æris*.

Lead put into this spirit, or fair water with the Animals themselves being alive, makes a good *Saccharum Saturni* : Iron put into the spirit affords an astringent tincture, & by repetition a *Crocus Martis*.

Take *Saccharum Saturni* thus made, & distill it, & it will afford the same acid spirit again, which the *Sac : Sat :* made with vinegar will not doe, but returns an inflammable oil with water, & nothing that is acid. *Saccharum Saturni* made with *viride æris* does the same in this respect with that made with Sp: of Pismires.

When you put the animals into water you must stir them about to make them angry, & then they will spirt out their acid juice.

No animal that ever we distilled [he speaks of his brother & himself] except this yields an acid spirit, but constantly an urinous, and yet we have distilled many, both flesh, fish & insects.

Hitherto Mr. Fisher, who desires to be informed, whether any ingenious person conversant in these enquiries hath himself found out or heard of any other animal that by distillation or otherwise yields an acid spirit. For my part I know of none. But if any do, probably the favisicous and gregarious kind, & generally such as are furnished with stings, of which weapon Pismires are not unprovided. Indeed it seems very strange that nature should prepare and separate in the body of this insect without any sensible heat, & that in good quantity considering the bulk of the animal, a liquor the same for kind with those acid spirits which are by art extracted out of some minerals not without great force of fire.

I doubt not but this liquor may be of singular use in



medicine. Mr. Fisher has assured me, that himself has made triall thereof in some diseases with very good successe.\*

As for the motion or passage of Spiders through the air, hanging on the end of the threads, they have darted out; though their progress be wholly to be attributed to the wind wafting of them, yet they seem to have a power to steer or direct their course upwards, downwards & it may be laterally, as they please. For I have seen some mount up almost perpendicularly in the air to that height that I quite lost the sight of them, others suddenly sink in their motion, and others proceed almost parallel to the horizon. One or two observables in their flight I took notice of, not yet published: viz. 1. That a spider hanging in the air by a thread he draws after him (as there are few but have experienced some of them will do, if shaken from one's hand or a stick) will, besides that, he hangs on, shoot out another before him to a great length: so that it seems he has sundry holes, out of which he can shoot threads, & also can make use of some and not of others, or of all together as he lists. *Blancanis* (as I find him quoted by *F. Redi*) having observed this phænomenon, but not understanding the projection of threads, imagined that the web that the spider drew out & upon which she hung did splitt in sunder, & part of it by the wind was driven before her, she hanging upon the other part. 2. Spiders thus hanging, when they have shot out such a thread as we mentioned, seem to have power at their pleasure to snap in sunder the thread they hang by, & sail away with the other.

40. *Royal Society Letter Book*, No. 12. Endorsed by Oldenburgh: "Mr. Ray's letter, clearing a passage

\* Thus far this letter was printed with a few minor alterations in the *Philosophical Transactions*, No. 68, Feb. 20, 1670-1. The following passage concerning the darting of Spiders, was also transcribed by Oldenburg in a letter dated London, Jan. 18, 1670-1, addressed "To his honored friend Martin Lister Esquire at his house without Mickel-gate-barr at Yorke."—(MS. *Lister* 34, no. 2).



lyable to exception in his former of jan. 13, 1670-1, together with an account of ye manner of Spiders projecting their threds."

For Mr. Oldenburgh.

MIDDLETON, Feb. 8, 1670-1.

Sr,

Whereas in my former there is a passage liable to exception & mistake, viz.: Spirit of salt & oil of sulphur dropt upon Cichory flowers did not cause them to change colour, for the clearing thereof you may please to take notice, that it is to be understood of the flowers entire & unbruised: for any blew flowers being a little bruised, & then a drop of spirit of salt or any other acid spirit let fall thereon, will turn instantly red. The reason is obvious, for that the leaves of the flowers (as all the other parts of the plant) being invested with a skin or membrane, the liquor dropped thereon cannot easily penetrate it, & so commix itself with the interior juice or pulp. Hence it is that if these flowers be put into cold vinegar, especially if the weather be cool, they will not change colour for a considerable time; but if you heat the vinegar they will change immediately. Whether the Ants do only drop this tinging liquor upon the surface of the flowers, or thrusting their stings into the body of the flower, doe by them convey it immediately into the interiour included juice we cannot yet determine, but referre to future observation when the time of the year will afford us flowers. What diseases they are wherein Mr. Fisher hath with successe exhibited this juice when I have consulted him I shall acquaint you.

[JOHN RAY.]

Ray's next letter, dated from Middleton was printed in part in the *Philosophical Transactions*, vi, p. 2219, under the title, *Concerning Spontaneous Generation; As also some Insects smelling of Musk*. The complete version is as follows:

44. *Royal Society Letter Book*, No. 13.

These for Mr. HENRY OLDENBURGH secretary to the Royall Society at his house in the Pell-mell London.

( $\frac{JY}{4}$ )

MIDDLETON, July 3, 1671.

Sir,

Had I not been absent from this place when your Letter came hither, you had not so long expected an answer. As to the particulars therein contained, I remember well that Mr. Lister did a good while since write me his opinion concerning *Vegetable Excrescences*\* and the insects therein bred or haboured; but the letter containing that discourse I have not at present

\* Oldenburg seconded Ray's request as to the reading of this paper in a letter to Lister dated 13 July, 1671.

"To his honored friend MARTYN LISTER Esquire at his house without Mickel-gate-barr at York."

" . . . Only let me desire this favor of you, yt when you find it convenient, you would gratify ye R. Society with your thoughts concerning Vegetable Excrescencies, ye account of which, it seems, Mr. Wray sent away with some other letters and papers into Essex, as he signified to me himself by letter, mentioning withall, yt he had made it his request to you as well as I, to take ye pains of writing your thoughts again on yt subject. . . .

" Having inquired of Mr. Wray concerning an Insect feeding upon *Ranunculus*, and said to yield a musky scent when dried, I had for answer, he had no knowledge of yt particular; but he then call'd to mind two sorts of Insects, he had seen, which smell of musk: ye one, ye common Capricornus or Goat-chafer, smelling so strong of yt perfume, yt one may sent it at a good distance as it flyes by or sits near you: ye other is a smal sort of Bee, wch in ye South and East-parts of England is frequently to be met with in gardens among flowers in the Spring-time.

" Mr. Willughby, who hath a great respect for you, as well as Mr. Wray and many more, writeth yt ye Scolopendra, spoken of by ye German Philosophers in *Transact.* No. 68, p. 2082, § 31, as shining in ye dark, and sparkling when comprest, is yt which is our *Bruchus* described by Muffet. . . ."—(MS. *Lister* 34, no. 17.)

From Oldenburg "To his honored friend MARTYN LISTER Esquire at his house without Mickelgate-barr at York." London, July 27, 1671.

" Sir,

" Your considerable Accompt concerning Vegetable excrescencies, so generously communicated in your last of July 17, I have well received, and doe intend, God permitting, to impart the same to the R. Society, as soon as they shall open their meetings again, which are now intermitted, as they are wont to be about this season. I hope, you will permit the publication of this matter, especially since Mr. Willughby, who hath formerly seen it, when you wrote it to Mr. Wray, giveth it also this Character, that it is so very ingenious and true, yt he would fain it were known; who also adds, that when I shall have sent him word, I have received it from you (which I doe by this very post) he will send me a great many Observations, both of his own and Mr. Wray's, to confirm it. . . ."—(MS. *Lister* 34, no. 18.)



by me : it being sent away in a bundle of other letters & papers into Essex. I have therefore written to him to desire him to take the pains himself to send you his thoughts upon that subject.

Whether there be any *Spontaneous* or *Anomalous Generation* of Animals, as hath been the constant opinion of Naturalists heretofore, I think there is good reason to question. It seems to me at present most probable, that there is no such thing ; but that even all Insects are the natural issue of parents of the same *species* with themselves. *F. Redi* hath gone a good way in proving this, having cleared the point concerning generation *ex materia putrida*.\* But still there remain two great difficulties. The *first* is, to give an accompt of the production of Insects bred in the By-fruits and Excrescencies of Vegetables, which the said *Redi* doubts not to ascribe to the Vegetative Soul of the Plant that yields those Excrescencies. But for this I refer you to Mr. *Lister*. The *second*, to render an accompt of Insects bred in the bodies of other animals. I hope shortly to be able to give you an account of the Generation of some of those Insects, which have been thought to be *spontaneous*, and which seem as unlikely as any to be after the ordinary and usual way.

Of such an Insect, as you mention, feeding upon *Ranunculus*, which when dried yields a Musky sent, I have no knowledge. I can at present call to mind but two sorts of Insects that I have seen, which smell of Musk. The *one* is like the common *Capricornus* or *Goat-chaffer*, which is mention'd by all Naturalists that write of Insects, and which smells so strong of that perfume, that you may sent it at a good distance as it flies by, or sits near you. The other is a small sort of *Bee*, which in the South and East parts of England is frequently to be met withal in gardens among flowers in spring-time.† I remember, they were very plentiful in Sir Edw. Duke's *Tulip-Garden*, when the Tulips

\* Of this author an account was given in No. 66, p. 2436.

† These facts were promptly communicated by Oldenburg to Lister on July 13 (*MS. Lister* 34). See p. 55 note.



flowred. Sir Edward is now dead ; his house was not far from *Saxmundham* in *Suffolk* ; the name of the Parish I have forgot.

I have by me the Description and Anatomy of a *Porpesse* (which fish I happily met withal at *West Chester* being with my Lord-bishop of that place) in which there are some particulars, that I find not in the descriptions of *Rondeletius* or others, which, if you please, I shall send you.

Now give me leave to take notice to you of a mistake or two in the *Philosoph. Transactions* which concern me, the one is N. 68. p. 2064 within three lines of the bottom, where after “Cichory flowers” is omitted “but also Larkspur, Borage,” for as it stands now it is not grammatical sense. I know not whether this was my omission or yours : the other is N. 70. p. 2134. l. 7, where *Fungus* is put instead of *muscus* ; but these errata I esteem not so material as to need correcting. This is all at present I have to trouble you with. I rest,

Your humble servant,

JOHN RAY.

I am this day beginning a voyage into the North & shall not return hither this month or five weeks.

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The musky smell of certain insects was confirmed by Martin Lister in a letter written by him at York on August 25th, 1671, and printed in the *Philosophical Transactions*, No. 76, p. 2281.

Willughby records another of Ray’s accurate entomological observations in the same journal, p. 2280 :

“This year Mr. Ray, in company with another ingenious neighbour, observed one [a “great Ichneumon”]\* haling a large green caterpillar much bigger than herself, which after she had drawn the length of a pearch, she laid down, and then takes out a little pellet of earth, with which she had stopped the mouth of a small hole like a worm-hole ; then she goes down into it, and staying a very little comes up again, and draws the *eruca*

\* A sand wasp, *Ammophila* sp.

down with her into the hole, and there leaves her ; and afterwards not only stops but fills up the hole, sometimes carrying in little clods, and sometimes scraping dust with her feet, and throwing it backwards into the hole, going down after herself to ram it close. Once or twice she flew up into a Pine-tree, which grew just over her hole, perhaps to fetch cement. When the hole was full, and even with the superficies of the ground about it, she draws two Pine-tree leaves, and lays them near the mouth of the hole, and flies away. Not taking notice that she came any more in three or four days, we digged for the Caterpillar, and found it pretty deep. I put it into a box, expecting it would have produced an *Ichneumon*, but it dried away and nothing came of it."

*An Account of the Dissection of a Porpess, promised Numb. 74 ; made, and communicated in a letter of Sept. 12, 1671, by the Learned Mr. John Ray, having therein observ'd some things omitted by Rondeletius.*

**45.** *Royal Society Letter Book, No. 14.*

These for Mr. HENRY OLDENBURGH secretary of the Royall Society at his house in the Pell Mell.

( $\frac{SE}{15}$ )

MIDDLETON, Sept. 12, 1671

Sir,

About the later end of April 1669, being at West-chester with my Lord Bishop of that Diocesse, in the company of *Fr. Willughby* Esq. I had the good fortune to meet with a young *Porpesse* of a convenient size for dissection, brought thither by some fishermen, who caught him upon the sands where the tide had left him ; in the *Anatomy* whereof I observed some things omitted by *Rondeletius* in his Description of the *Dolphin*.

The length of this fish was by measure 3 feet and 7 inches. A string of 2 feet and 2 inches girded him in the thickest place. The shape of his body was not much unlike that of a *Tunny-fish*, only his snout longer and sharper ; his skin was thin, smooth, and without scales. In an old and well grown fish, it's like the



skin may be thick and tough, as *Rondeletius* represents it. His fins are cartilaginous, and flexible, not sharp or prickly, as the ancients report them. On his back he hath only one, which was distant from the tip of his snout 1 foot and 9 inches, and the basis of it in length  $5\frac{1}{2}$  inches; so that measuring from the tip of his snout to the end of the tail, it was situate somewhat below the middle of the fish's length. On the belly it had only one pair of fins  $9\frac{1}{2}$  inches distant from the tip of the lower mandible, much about the place where the foremost pair of fins in other fishes usually grow. The tail is forked, of the figure of a crescent, the breadth thereof from angle to angle 11 inches. The *situs* or position of it contrary to that of all other fishes, except those of this kind. For, whereas the plain of the tail of other fishes, when they swim, stands erected perpendicularly to the plain of the horizon, in this fish (and I suppose in all others of the *cetaceous* kind) it lyes parallel thereto. The reason whereof I conceive to be partly to supply the use of the hindmost pair of fins in other fishes, which serve to balance the body, and keep it up in the water, answering in proportion to the hinder legs of a quadruped; hence we see, that those fishes which have long bodies and but one pair of fins, as Eels and the like, cannot keep themselves up in the water, but lie always groveling on the bottom; and partly to facilitate the fish's ascent to the top of the water, (to which he can immediately raise himself by a light jerk of his tail, thus placed) for the use of respiration, which is necessary for him, as for Quadrupeds. For doubtless, if violently detained under water, he would in a short time be suffocated or drowned.

Immediately under the skin lay the fat, which, as I remember, our seamen call the *Blubber*; it was firm, full of fibres, and in this small fish of an inch thickness, encompassing and enclosing the whole body, back, belly and sides. The use whereof I conceive to be, 1. To keep the cold water at a distance from the blood, which is, I believe, actually and to the touch hot, in a degree not much inferior to that of Quadrupeds, and therefore by immediate contact of the water would be apt to be chilled. 2. To keep in the hot steams of the blood from evaporating, by that means also preserving and maintaining its natural heat, as we see water, and any other liquor in a close vessel will retain its heat much longer than in an open; and nothing is more proper to detain the finest and subtillest evaporations and spirits, than oil or fat. 3. Perhaps also, to lighten or counterpoise the body of the fish, which would otherwise be too heavy



to move and swim in the water. Under the *Blubber* lay the muscular flesh like to that of *Quadrupeds*, but of a darker colour.

The body was divided into three regions, or *Ventres*, like a *Quadruped*, viz. head, breast, and belly. The vessels and *Viscera* in each *Venter*, for the main the same as in *Quadrupeds*; the *Abdomen* was compassed about with a strong *Peritonæum*; the *Guts* joined to the *Mesentery*, and of a very great length, by measure 48 foot, without any difference or distinction of great and small, neither was there any blind gut, or *Appendix*, that I could find; the *Stomach* was of a strange make, being divided into two large bags, beside other smaller ones. I found nothing in it, but a good number of those little long fishes, which our fishermen dig out of the *sands* at low-water, and therefore called in some places sand-eels; by some they are called *Launces*, and by *Gesner*, *Ammodytæ*. The *Liver* was of a moderate size, situate in the right-side, and divided into two lobes, having no *Cystis fellea*, or receptacle of gall annexed. The *Pancreas* large, sticking close to the third bag of the *Stomach*, into which also its *Ductus* enters, and empties it self. The spleen small and roundish: The kidneys large, sticking close to the back, and lying contiguous one to the other, made up of many little kernels, like to, but much lesser than those of an ox, of a flat figure, having no *Pelvis* in the middle, but the *Ureters* going out at the lower end. The *Urine-bladder* oblong, and little for the bulk of the animal, having on each side a round ligament, made of the umbilical arteries degenerating: The *Penis* long, slender, having a small sharp *Glans*; it appears not outwardly, but lies hid in its *Sheath* within the body, doubled up, or rather reflected, in the form of the letter S, as is that of a bull. The *Testicles* lie within the *Cavity* of the *Abdomen* on each side, as they do in ye *Hedge-hog*, and some other *Quadrupeds*, of an oblong figure; for their internal substance, seminal vessels, both *Præparantia* and *Deferentia*, *Epididymides*, *Vas pyramidale*, *Corpus Varicosum*, and *Glandulæ Prostatæ*, exactly like to those of *Quadrupeds*. The seminal vessels perforate the *Urethra* with many little holes, whereof four are most conspicuous, somewhat above the neck of the bladder.

The *Diaphragm* was muscular, as in *Quadrupeds*. The *Heart* large, included in a *Pericardium*, had its two ventricles; its *valvulæ sigmoides & semilunares*, *tricuspides et mitrales*; its coronary arteries and veins; in a word, the whole structure and substance of the heart and lungs agreed exactly with that of *Quadrupeds*. The wind-pipe was very short, as it must needs

be, the fish having no neck, the *Larynx* at top was of a singular figure, running out with a long neck, and a nob at the end like an old-fashioned *Ewer*.

The pipe in the head, through which these kind of fish draw their breath, and spout out water, lies before the brain, and ends outwardly in one common hole, but inwardly it's divided by a *bony Septum*, as it were, into two nostrils ; but below again it opens into the mouth in one hole. This lower orifice is furnished with a strong sphincter, whereby it may be shut and opened at pleasure, and above this sphincter the sides of the pipe are lined with a glandulous flesh, which if you press, you will see start out of the many little holes, or *Papillæ*, into the cavity of the pipe, a certain glutinous liquor which serves as I suppose to keep the parts thereabout slippery. Above the nostrils is a strong valve or membrane, like an *Epiglottis*, which serves to stop the pipe, that no water may get in there against the fish's will. Within the *Fistula* are six blind holes, having no outlet ; four tending toward the snout, two above the valve that stops the nostrils, and two beneath it, and two tending towards the brain, having a long but narrow cavity for the use of smelling, as I conjecture ; though opening the brain, I could find neither olfactory nerves, nor *Processus mammillares*.

The eyes are small, considering the bigness of the fish, and situate at a good distance from the *Basis* of the brain ; the snout is long, and furnished with very large and strong muscles to root or turn up the sand at the bottom of the sea for to find fishes, as appears in that we found nothing in his stomach but sand-eels, which, as was intimated before, lie buried in the sand. The Brain and *Cerebellum* are, for the substance and *Anfractus* of them, the same with those of *Quadrupeds*, only differing in the figure, as being shorter ; but what they want in length, they make up in breadth. They have also the like teguments called *Dura* and *Pia Mater* ; six or seven pair of nerves, besides the optick ; the same ventricles ; only in the *Medulla oblongata* we observed not those protuberances call'd *Nates* and *Testes*. The skull (*Cranium*) is not so strong and thick as in *Quadrupeds* ; but articulated after the same manner to the first *Vertebræ* of the back-bone. This largeness of the brain, and correspondence of it to that of man, argue this creature to be of more than ordinary wit and capacity ; and make to seem less fabulous and improbable those ancient stories related by *Herodotus* concerning Arion, by *Pliny* the Elder, concerning a dolphin enamoured of a boy,



whom he was wont to carry cross a bay of the sea, from *Baiae* to *Puteoli* to school, etc. By *Pliny* the Younger, of another enamoured of a boy at *Hippo* in Africa whom he was wont to carry on his back in like manner. The story is worth the noting: *Plin. Epist.* 33 l. 9.

But to proceed ; this fish had in each jaw 48 teeth, standing in a row like to little blunt pegs. The tongue was flat above, an equal breadth to the very tip, which was toothed or pectinated about the edges, tied firmly down to the bottom of the mouth all along the middle, as *Aristotle* truly saith.

Whence I cannot but wonder that *Rondeletius* should herein contradict *Aristotle*, and affirm, (contrary to truth, as I believe) *quod Delphinis lingua est mobilis, quæ modo exeri modo condi potest*; unless perchance in this particular the *Dolphin* differs from the *Porpesse*. For the *Porpesse* is, as I take it, the *Phocæna* of the ancients, which is a lesser sort of *Dolphin*, and not the *Delphinus*; at least if the fish we are describing were a *Porpesse*; for the teeth of this fish were lesser than, and of a different figure from those in the jaw of the *Dolphin* we got beyond seas, yet is the difference not great between the *Dolphin* and *Phocæna*. As for that fish, which our seamen now a-days call the *Dolphin*, and which, as it is described by Mr. *Terry* and *Ligon*, hath teeth on its tongue, small scales, is finn'd like a rock, of a pleasant smell and taste ; what it is I know not, but I am sure it is *toto Genere* different from the *Dolphin* of the Ancients.

We observed not in this fish any nostrils, besides those in the *Fistula*, nor any ear-holes or *Meatus auditorii* at all ; wherein also *Aristotle* agreeth with us, which yet *Rondeletius* found out near the eyes : it being manifest, saith he, that a *Dolphin* doth hear, and seeing no creature can hear without a passage for that purpose to convey sounds to the brain : *Hac ratione impulsus, cum Delphini cranium diligentissime contemplatus essem, manifestissimum audiendi meatum, qui ad cerebrum usque patet, inveni statim post oculum, tam exiguum, ut fere oculorum aciem fugiat.* And we observed in the skull a bone, answering to the *Os Petrosum*, which most certainly was the use of hearing.

It had six short ribs that had no cartilages, and seven that had cartilages (on each side I mean). The breast-bone was very small.

As for the name *Porpesse*, I agree with *Gesner*, that it was so-called, *quasi Porcus Piscis*, most nations calling this fish *Porcus marinus*, or the *Sea-swine*. Indeed it resembles a swine in many particulars, as the fat, the strength of the snout, &c.



[Thus far the letter with some omissions was printed in the *Philosophical Transactions*, vi, No. 76, p. 2274, for Oct. 1671. The letter concludes]:

The book & Epistle of Pliny I have forgotten & have not now the book by me, wherefore I desire, if you think fit to publish it, you would supply them. Mr. Willughby returns you thanks for yr Lr. He hopes to see Mr. Lister next week. Your letter to me which you mention in your last to Mr. Willughby never came to my hands, else you had received the enclosed description sooner. I have no more at present but to assure you that I am

Sr, Your very humble servant,

JOHN RAY.

This letter was read at the meeting of November 9, 1671, and the writer being present received the thanks of the Society.\* At the next meeting on November 23 Mr. Ray produced a letter written to him by Mr. Fisher out of Yorkshire, giving notice, that the said Mr. Fisher had newly found out a menstruum that dissolved glass, and reduced it to a white calx; and that after the glass is well moistened with the menstruum, it may be shaved with a sharp knife almost like horn, though it be much more brittle than horn.

Mr. Ray was desired to inquire of Mr. Fisher 1. Whether he was so much master of this experiment, as to make it when he pleased. 2. Whether the menstruum performed as well upon the best and finest, as upon the worst and coarsest glass. At the same meeting Mr. Willughby and Mr. Ray were desired to try an experiment at a favourable season, to test a narrative written by Mr. Francis Finch on November 14, 1671, concerning a maggot, which by an extraordinary way of feeding was increased to the size of a man's thigh.

At the meeting held on December 7 "Dr. Walter Needham read part of a letter to himself from Mr. John Templer dated Dec. 3, 1671, endeavouring to

\* "Mr. Willughby and Mr. Ray are at present both in London, and speake with much kindness and respect of you." Letter of Oldenburg to Lister dated Nov. 18, 1671. No. 24, *MS. Lister* 34.

confirm what he had formerly related about the breeding of insects bred in the livers of eels dried and closed up ; and that by an experiment of insects bred in a beef's bladder, blown in July or August, and so closed that no passage was left for any fly-blows."

Mr. Ray suggested that flies might have blown on the outside of the bladder, and that those fly-blows might eat through the bladder. He was desired to try this experiment in a season proper for it, by including such a bladder in a case, to defend it from fly-blows outwardly as well as inwardly.

On July 3, 1672, Ray's greatest friend, Francis Willughby, died, aged 37.

Letter from OLDENBURG to LISTER. *Dated* London Oct. 31, 1672.

[*Addressed*] To my honor'd friend Dr. MARTYN LISTER at his house in Stone-gate at Yorke.

. . . I hope, Mr. Ray will not keep too long your paper concerning ye milk-yielding Mushrome, yt we also may have the perusal of it, together with ye lately-mentioned account about ye Spaw-waters. . . .

And not long after yt, we shall have finisht by ye Presse Mr. Willoughbies and Mr. Rays Voyages ; of which I have already seen divers sheets printed off.\* . . .

[*MS. Lister* 34. Letter 33.]

A part of one of Ray's letters to Lister is preserved as an appendix to a paper by the latter on *Astroites* or *Star-stones*. Already in June, 1673, Lister had written to Ray to inform him that he had been at Bugthorp and had found some Star-stones branched. The discovery of these fossils was the subject of a letter to Oldenburg on January 19, 1673/4, which was printed

\* Ray, Observations topographical, moral and physiological made on a Journey through part of the Low Countries, Germany, Italy and France with a Catalogue of Plants not native in England. . . . Also . . . F. Willughby his Voyage through . . . Spain. London 1673.



in the *Philosophical Transactions* for March 25, 1675, with the following note by Ray :

I was much taken with your observations concerning the Star-stones, and inform'd in several particulars. For, although I had often seen, and myself also sometimes gathered of those bodies ; yet I did never curiously note the texture, parts and differences of them. As for their *Original*, if you can allow the *Trochites* and *Entrochi* to have been fragments of *Rock-plants*, I see not why you should make any difficulty of admitting these to have been so too ; the several *Internodia* being alike thin in both, and the *Commissures* not much different ; only the external figure doth not correspond. But it is to be considered that many of the *Trochites* have a pentagonous hole in the middle of them, which if we admit for the receptacle of the pith, it will be as hard to exemplifie such a figured pith, as such a figured stalk in Land-plants. Your note concerning the Wyers springing out of the furrows or concave angles of some of the *Internodia*, and incircling the stalk like the leaves of *Asperula* or *Equisetum*, seems to me to argue these bodies to belong to the *Genus* of *Vegetables* ; no less than *Coral*, *Coralline*, and the several sorts of *Pori*, some of which are also jointed : But no *Vegetable* either of land or sea, that I know of, hath such frequent joints and short or thin *Internodia*, and so they are things of their own kind, whose species is, for ought we know, lost. If they were *Vegetables*, I guess they were never soft, but grew upon the rocks like *Coral*, and the other stone-plants, just as they are.

The leaves of some sort of *Equisetum* are *jointed*, as well as the stalk ; else I know no plant that hath jointed leaves, except some sort of *Rush-grass*, though those bristles of *Equisetum* surrounding the stalk, neither these reported leaves of *Rush-grass* can properly be called leaves, being round and having no difference of upper and lower superficies. Now that I have upon this occasion mentioned *Equisetum*, give me leave to mind you of what I have already published to the world, that I have found on the banks of the river *Tanar* in *Piedmont*, plenty of the *fragments* of the Stalks of *Equisetum* perfectly *petrified*, with little or no increase of bulk, so exactly like the plant, that all the *Striæ* did all along clearly appear. The colour of these petrefied stalks was white.

[*Philosophical Transactions*, No. 112, p. 278.]



52. *Royal Society Letter Book*, No. 15.

For his honoured friend HENRY OLDENBURGH Esquire secretary to the Royall Society at his house in ye Pell-mell, London.

(SE  
21)



MIDDLETON, Sept. 19, [16]74.

Sir,

I received yours of Sept. 15, containing somewhat from Sgr. Boccone by way of answer to the letter I sent him, which it seems was not subscribed. I can scarce persuade myself to believe that I was guilty of such an omission. Concerning the matter of his letter I shall add nothing at present, intending heerafter, when I shall have more leisure to write further to him, about other particulars in his Book. I thank you for the information given concerning the East India birds; if they be distinct from any yet described, & the person that brought them can give any tolerable account of them, their names, natures & qualities &c: I am of your opinion that they ought not to be neglected, but by all means taken into our History of Birds, & if they be brought to London shall accordingly give order that they be drawn & engraven. The small birds, by your description of them, I guess to be the same that I have myself seen & described in London, but besides the description I made, I have nothing of the history of them: but as I remember, he that showed them me told me they made use of them to fight as we do of Cocks in England; in which sure either I misremember or he was mistaken, for there were six of them kept together in the same cage. If we get them figured, I must entreat some friend to take a description of them in words, I mean their bigness, shape of the whole body, & particularly of their bills, feet and claws, colour of their bills legs & feathers especially of their wings & tails, the length & figure of their tails & any other considerable or distinctive accident.

I do very much approve of the design & intention you mention of the Council of the R.S. to engage their members such as are able & willing, to entertain them yearly each of them with one discourse grounded upon experiment &c, and think they proceed upon good grounds in taking such a course, & do hope & believe it may have the effect they promise themselves of making their meetings more considerable & inviting: certainly it will more equally divide the burthen, & by taking in the absent, ease those that are oppressed. But for my part I do not think myself qualified for such an undertaking, for though I am as willing as any to contribute what I can, yet I find not that ability which is requisite to such a performance. To speak the truth I have neither ability nor leisure to make experiments in any kind: ability I mean neither of wit nor purse, having no good projecting or inventive faculty. And therefore if such an exercise the Society expects as is grounded on experiment I dare not promise anything, & must desire to be excused. But if something that I have observed in the History of plants or Animals, (in which particulars only I can pretend to the knowledge of anything not common) may be acceptable, I shall not be wanting to do my part in what is propounded: which is all I have to say concerning this particular, & to trouble you with at present, resting,

Sir, Your very humble servant,

JOHN RAY.

**53.** *Royal Society Letter Book*, No. 16.

These for HENRY OLDENBURGH secretary to the Royall Society at his house in ye Pell-mell London.

( $\frac{DE}{2}$ )



MIDDLETON, Nov. 30, [16]74.

Sir,

I have this week by the Tamworth carrier sent you a paper of such sorry observations as I have made



concerning the Seeds, & concerning the specific difference of Plants. These last I have in part already published in the prefaces to my two catalogues of Plants, & therefore you may choose whether you will read them to the Society or not. The former concerning the seeds of Plants are but inchoate & imperfect. I hope (God willing) next Spring to prosecute & perfect my design of distinguishing Plants by the content of the seed. I should not have presented them so soon to the Society but that I have nothing better to send, & am unwilling to be wanting in the carrying on so good a design as they have now set on foot. Where this note \*\* is, I have left out, & not explained nor given instances of one member of Division, because when I wrote the papers, I hoped I should have made some observations concerning the seeds of bulbous plants, which I could not; you may please to supply it thus.

Of the second sort, viz. those in which the included plant makes up the whole pulp of the seed, are (I suppose) all bulbous plants, for that these have no seed-leaves, but come up with leaves like the succeeding, is evident; and at first springing bringing up upon their leaf the husk of the seed empty, it is most probable that there was nothing else in the seed but the young plant. For had there been any thing in the seed of nourishment for the young plant, most probable it is, that the husk being the vessel containing such nourishment, should remain fastened to the bottom of the plant, & not be brought up with the leaf. The next Spring I intend (God willing) by ocular inspection to determine this, & not to go upon probabilities. This paper I have directed to Mr. Martyn & desired him to send to you. It will come to his hands on Saturday next. I might have spent much time & paper in confuting what others both Ancients & Moderns have written of the seeds of plants, but because *Rectum est index sui & obliqui*, I thought that needless, especially considering how tender men are of their reputation &



unwilling their assertions should be (though never so modestly) confuted or contradicted.

I have not as yet heard any further of Johnston's new book you wrote me word of, though I sent to Mr. Martyn to enquire for & procure it me. Though indeed I expect nothing considerable from him, who is a meer compiler, & discovers himself to have no skill at all in the History of Animals. If anything come your way, which may add anything of substance or ornament to our new Ornithology, I pray be pleased to communicate it. I intend (God granting life & health) to put out also all the other parts of the History of Animals, wherein I shall also be beholden to you for your contributions. The History of Insects is that wherein Mr. Willughby did chiefly labour and most considerably advance; which yet for some reasons I reserve for the last. Pardon my importinency, & impute it to my zeal for the promoting of real & useful knowledge, in which design you have so happily employed yourself. I rest,

Sr, Your very humble servant,

JOHN RAY.

December 17, 1674. Mr. Ray's two discourses, one on the Seeds of Plants and another on the Specific Differences of Plants, were presented from him by Mr. Oldenburg, and read and ordered to be registered.\* Oldenburg under date Dec. 19, 1674, forthwith communicated the news "to his much honored Friend Dr. Martyn Lister at his House at Stone-gate in York."

" . . . The persons, yt have, since our new regulation, entertained ye Society with their Experimental Exercises, are, Mr. Boyle, Dr. Wallis, Sir William Petty, Mr. Hook, Dr. Grew, Mr. Ray; ye first treated of the *Mechanical Origine or Production of Fixtnes†* . . . ye 6th, of ye *Seeds, and specifique difference of Plants*. As these pieces will doubtlesse, all be printed in due time, and those yt shall follow ym; so it was

\* Register, iv, pp. 286, 294.

† *i. e.*, Fixedness.

thought good, forthwith to print yt of Sir William Petty's . . . ."

[*MS. Lister 34, No. 78.*

#### A DISCOURSE ON THE SEEDS OF PLANTS.

Nature observes not proportion of magnitude between seeds and the plants, that come of them ; I mean so, as that the greater seed should produce the greater plant, and the lesser seed the lesser plant : for the seeds of several trees are much less than the seeds of many herbs : as for example, the seeds of elm, poplar, willow, birch, alder, than the seeds of beans, pease, lupines, and all kinds of pulse, pumpions, melons, and all kind of pomiferous herbs, not to mention infinite others. This holds true, not only in plants of different kinds, but even in those of the same, as I have observed in oaks ; the scarlet oak, which seldom rises higher than a small shrub, bearing an acorn as big as our English oak : and in honey-wort, the purple annual kind bearing a seed twice as big as the great perennial mountain kind. The like difference may be observed between the seeds of mustard and charlock, several sorts of lotus, and many others.

Neither indeed in oviparous animals doth nature always observe the same proportion of magnitude between the eggs, that is, between the animals, although of the same tribe or genus : for, though lobsters or crayfish be so like one to the other, that one can find little difference between them, save only in magnitude ; yet are the eggs of the crayfish, which is the lesser, bigger than those of the lobster, which is the greater ; and, in whole-footed birds, the eggs of the duffin, auk, and guillemot (which lay but one egg at a time) are as much bigger than ducks eggs, as the birds themselves are less than ducks.

Though in some plants, which run much by the root or wire, or that propagate themselves by off-sets, it be true, which some have observed, that they seldom bring their seed to maturity, as if nature, intent upon those ways of propagation, did neglect that by the seed : such plants are colocasia, horse-radish, periwinkle, Jerusalem-artichoke ; though, I say, this held true in some, yet is it far from a general rule ; there being many plants, which abundantly propagate themselves by the root or wire, and yet yield plentiful ripe seed too, as goutwort, mint, strawberry, &c. But on the other side, I think, it may pass for a general truth, that plants, which bring little seed to maturity, do abundantly spread or multiply themselves some other ways ;



else nature might seem to be wanting in means for the conservation of such species.

The lesser seeds are the most fertile ; such plants as bear the least seed bringing the greatest plenty or abundance, as, for example, tobacco, which, for a plant of that bigness, bears the least seed of any I know, producing the greatest number of seeds ; Laurembergius counting from one plant an encrease of three hundred and sixty thousand.

Among the seeds of herbs I have observed, that the greatest of all are such as come of annual plants, to wit, beans, pease, lupines, maiz, or Turkey-wheat, &c. In these kinds (of pulse and grasses) the annual (though sometimes less plants) have greater seeds than the perennials ; as for instance, the common pease than the everlasting pease ; but always, I think, it happens so in these kinds, if the plants be of equal bigness, that the seeds of the annual are larger than the seeds of the perennial.

It is worth the noting, that all those seeds, that are used by mankind for food, are seeds of annual plants, viz. wheat, rye, spelt, maiz, rice, barley, oats, millet, panic, sorghum ; and of pulse, beans, pease, lupines, kidney-beans, vetches, lentils : the reason whereof, I suppose, is no other, than because they are in their kinds the greater, and have the more pulp. For I doubt not but many perennial grasses bear esculent seed, as well as these annual ones, which we call corns ; and I believe some perennial pulse too, though none so large as these annual ones we use.

The greatest number of plants, that come of seed, spring at first out of the earth with two leaves, which being for the most part of a different figure from the succeeding leaves, are by our gardeners not improperly called the seed-leaves.

These seed-leaves are for the most part entire or undivided, even in those plants, whose after-leaves are most finely or minutely dissected, as in the umbelliferous kind. For the most part, I say, for in some few they are indented ; as in radish with one indenture, in Indian-cresse with two. In garden-cresse each seed leaf is divided into three segments.

The seed-leaves are for the most part smooth, even in those, whose after-leaves are rough or hairy. In some few, as for example, the Roman nettle, and I believe all other nettles, the seed-leaves also are rough.

In all those plants, which spring up with two seed-leaves, the whole pulp or content of the seed is nothing else but the young plant perfectly formed, mature, and ready for exclusion : so



that, if you carefully take off the teguments of the seed, either while yet green, or well steeped when ripe, you may clearly see and distinguish all the parts of the included plant, viz. the radicle or germen of the root, and two seed-leaves in all, and in some the rudiment of the stem and plant-leaves besides, as in the common bean and kidney-bean : in this last, the two first plant-leaves being perfectly formed.

In the seeds of these plants, when mature, I could never observe any cohesion between the teguments and the included plant.

Those seeds, whose pulp is nothing else but the included plant, are of two sorts. 1. In some the two seed-leaves lie plain, smooth, and extended, without plait or fold. 2. In others, the two seed-leaves, together with the radicle, are variously folded up.

In the first kind, the seed-leaves are nothing but the two lobes of the seed having their plain sides clapt together, like the two halves of a walnut ; and therefore are of the just figure of the seed, slit in sunder flat-wise, as in pumpion and melon seeds, and many others.

In these, though the whole pulp seems to be compounded of two lobes, yet to him that carefully views and examines it, the radicle also will easily appear, inserted into each lobe, and connecting both together like a couple or hinge.

This union of the radicle to the lobes is either, first, at that end of the seed, which coheres to the fruit or seed-vessel, as in apple and pear kernels, sun-flower seed, melon and pumpion seed, and abundance more : or, 2dly, At a distance from the place of cohesion, as in beans, lupines, and all sorts of pulse, &c. or, 3dly, At the quite contrary ends, as in borage, bugloss, and others of that family.

In such, whose radicle is at either extreme, I have observed it to be at the sharper or more pointed one ; so that if the sharper end of the seed be that, which coheres to the seed-vessels, the radicle is always at that end, as in apple or pear kernels, and the rest before instanced in : but if the sharper extreme be the tip of the seed, or the end just opposite to the place of cohesion, the radicle shall be at that end, as in acorns, almonds, &c. In both these kinds, the radicle must needs be short.

In such seeds, wherein the connexion of the lobes is at a distance from the place of cohesion, but not at the just opposite part or end, the radicle is longer than in the two former kinds, and runs bending along the verge of the lobes, till the tip of it comes to point at the place of cohesion.

This observation may be of some advantage in setting, at least the larger sort of seeds ; for it will certainly somewhat promote the springing of the seeds, so to set them, that the point of the radicle may be downwards, or at least so as they naturally lie, when fallen from their plants upon maturity. And it must needs hinder their growth, to set the point of the radicle just upwards, the radicle in such a case being forced to bend two right angles, or a whole semicircle, before it come to run directly down again ; and likewise, on the contrary side, the stem to turn as much before it can mount up ; so that the sap will have a double reflection before it get out of the root into the stalk.

In the second kind, that is those seeds, wherein the seed-leaves and radicle lie folded up, the pulp of the seed cannot properly be said to be divided into two lobes.

In these the complication of the leaves and radicle is very different. In the radish, turnep, and, I believe, all that come up with such a fashioned leaf, the young plant is most elegantly folded up into a globular figure, viz. the seed-leaves being clapt together, as in all others, first the radicle is turned up upon them ; then the two sides of the seed-leaves are turned over the radicle, one one way, the other the contrary, so embracing it. In the seed of the sycamore-tree, the two seed-leaves clapt together as before are first bent backwards upon themselves, and then with the radicle rolled up into a round roll, as if one should double a short and narrow ribband or thong of leather twice, and then roll it up. In the garden cresse, the two lateral segments of each seed-leaf being laid close on the back of the main, or end segment (as being together of the just breadth of it) the said end segments clapt together are so inclosed in the teguments ; the radicle being not turned up immediately upon the seed-leaves, but as it were first lying at length involved in the teguments, and so turned up upon the seed-leaves ; as if one should double or bend the seed together after it was inclosed in its coats ; as may be evidently seen by any one, that will but take the pains carefully to view and heed the seed. The like bending or doubling together of the seed I have observed in *dames violet*. Besides these, many other different ways there are of making up seeds in their teguments, which it would be tedious to describe, and difficult to understand, unless illustrated by figures : only I cannot but take notice, that though the maple be a congenerous tree to the sycamore, yet is the young plant in the seed differently folded up from that of the sycamore in its seed.



Of seeds, that spring out of the earth with leaves like the *succeeding*, and no seed-leaves, I have observed two sorts. 1. Such as are congenerous to the first kind precedent; that is, whose pulp is divided into two lobes and a radicle. The only difference between them is, that these bring not up their lobes above ground in form of leaves, as the other do, though I doubt not but the lobes of the seed have the same use in these as in those that bring them up. For in the same family of plants, some seeds bring up their lobes above ground, others do not, as in the legumina or pulse kind, the common bean brings them not up, the kidney-bean doth; the pease again doth not, the lupine doth.

2. Such, which neither spring out of the ground with seed-leaves, nor have their pulp divided into lobes; of these I have observed two kinds. 1. Such, in which the included plane is but a small part of the pulp of the seed; (in those I have hitherto observed I think scarce a tenth). 2. Such, in which the whole pulp is nothing else but the included plant. Of the first kind I have observed two sorts: 1. Such, in which the young plant sticks to that end of the seed, which grows to the seed-vessel or mother-plant, in form almost of a bud, together with its scutcheon, clapt to the body or branch of a tree in inoculation. 2. Such, in which the embryo-plant is inclosed in the middle of the seed, as it were a pith or kernel.

Of the first sort are all corns; I mean cerealia, as contradistinct to legumina, and grasses. All these have fibrous or stringy roots; that is, many small strings or wires, springing altogether from the bottom of the plant, (by the bottom I mean the commissure of the superficies, or part above ground and the root) and not one single body of a root, divided afterwards into branches and fibres. In a barley-corn I have observed six of these fibres or strings put forth before the blade began to stir.

The pulp of these seeds serves for the nourishment of the young plant when tender, notwithstanding it hath drawn root, as the yolk for the chicken's nourishment for a while after it is excluded, notwithstanding that it can feed itself by the mouth. This may be evidently demonstrated so to be in corn newly sown: for if you pluck of it up at first springing, you shall find the pulp in the grain almost entire; but afterwards plucking of it up from day to day, as it is older and older, you shall find still less and less of the pulp remaining, till at last there be nothing left, but the empty husk sticking to the bottom of the plant. The pulp is, by the moisture of the earth, strained



through the coats of the seed, dissolved into a cremor like chyle or batter.

In such of these seeds, as are covered only with thinner teguments, as for example, wheat and rye, the leaf breaks the teguments, and comes forth at the same end with the roots: in others, that are covered with thick husks, as barley and oats, the leaf creeps under the grosser husk to the opposite end, and there comes forth; notwithstanding that the germen or young plant is made up alike and affixed to the same end of the grain; and the first shooting of both, leaf and root, be from the same point, as well in this kind as in the other.

Of the second sort of seeds, in which the embryo-plant bears but a small proportion to the pulp of the seed; viz. such, in which it is inclosed in the middle of the pulp, as it were a pith, are 1. Pine-seeds, and I believe the seeds of all other coniferous and resiniferous trees, in the kernels whereof you may find a young pine-tree, perfectly formed, stem and leaves, as it appears at first coming up out of the ground. 2. Ash-seeds; in the middle of whose pulp you may find a little stem with two elegant leaves, not winged as the after-leaves are, but like two single lobes of the after-leaves; so that this tree seems to belong to the genus of those, whose seed is divided into two lobes, and comes up with two seed-leaves, whereas really it doth not. 3. Flower de luce seeds. 4. Asparagus seeds: in both these last the pulp of the seed, all but the embryo-plant, is of a gristly substance; which, whether it serves for nourishment or defence of the young plant, I know not. These seeds of this kind I have observed, and question not but there are many others of like nature.

In these and the former sort of seeds is true, what a great while since I published as a *general* observation; viz. that the seed at least in most plants did contain, besides the young plant, a convenient portion of nourishment for it while yet tender. But now I find in the most plants it holdeth not; for the far greatest number of seeds contain nothing of nourishment for the young plant, more than the pulp of the lobes; which yet may, and most probably doth, supply nourishment to the radicle, while it is shot forth, and comes to draw from the ground for itself, and reciprocally for them too. For the lobes or seed-leaves in most seeds, while yet included, are thick, pulpy, and brittle; and consequently have little of fibre, and much of flesh.

Of the second sort; viz. those, in which the included plant makes up the whole pulp of the seed, are (I suppose) all bulbous

plants : for, that these have no seed-leaves, but come up with leaves like the succeeding, is evident ; and at first springing up upon their leaf, the husk of the seed empty, it is most probable, that there was nothing else in the seed but the young plant : for, had there been any thing in the seed of nourishment for the young plant, most probable it is, that the husk being the vessel containing such nourishment, should remain fastened to the bottom of the plant, and not be brought up with the leaf. The next spring, I intend (God willing) by ocular inspection to determine this, and not to go upon probabilities.

All seeds, when fallen from their plants on the earth, do at first draw their nourishment by the pores of their coats or teguments.

There is great analogy between the nourishment and growth of the seeds of plants in the earth, and those of viviparous animals in the womb. For, as the seed of a plant, when ripe, falls to the ground, and there lying loose doth (as I said) first receive its nourishment by the pores of its teguments, and afterwards strikes root into the earth : so likewise the seed or egg of a viviparous animal, when ripened, as it were by the male, drops off one of the ovaria into the womb, where it lies for a while loose and free, without any adhesion to, or connection with, the womb ; drawing its nourishment through its involving membranes or secundines, and afterwards striking, as it were, root into the womb, fastens itself to it, and then probably draws at least part of its nourishment that way : and in this respect, a man, as all other animals, may be said to live first the life of a plant. By the ovaria, I mean the bodies usually called testes *fœminei*, which whosoever will but make use of his eyes, diligently to view in swine, and other multiparous and salacious animals, must needs acknowledge to be nothing else but masses or clusters of eggs.

Neither do the seeds, but I believe the roots of plants also, draw the greatest part of their nourishment by the pores of their coats or barks, and but little by the extremities of their capillary fibres, which yet some have made to be so many oscula or little mouths in plants, answering one great one in animals. That plants do draw by the pores of their barks, is evident from that manner of planting branches or slips of trees and shrubs mentioned by Laurembergius. First cut off the lower end of the slip to be planted, and having sealed it close up, put it into the ground bent, the middle of the bow being lowermost, and the lower or sealed end inclining upwards, yet so as to remain



still covered with the earth, the upper end only appearing above ground. For in this case the nourishment can get in no way but by the pores of the bark, at least if there be only one internodium covered.

And now, that I have mentioned this way of planting by the slip, I shall add, that I cannot but think it would be worth the while to practise it in all sorts of apple-trees, as well as in codlings and moyls ; this being, of all others, if it will succeed, the most easy and speedy way of propagation. For, though a graft may bear fruit as soon as a slip, yet is the stock some years growing before it be fit to graft on ; and then, a slip growing much faster will bear abundantly more fruit than a graft of its standing. Now that it will succeed, I think most probable ; there being no reason, why one tree of the same genus should grow of the slip, and not another, though perchance with more difficulty. In this opinion I was much confirmed by what I found in Mr. Josselyn's description of New England, viz. That the inhabitants there do practise, with good success, this manner of propagating all sorts of fruit-trees. If it be said, that trees thus planted will be shorter lived, and not last so long as those that are grafted ; I answer : 1. I doubt much, whether this hath been sufficiently observed, and not rather presumed, and taken up on weak and insufficient grounds. For there seems to me to be the same reason, why a graft should be short-lived, as why a slip, which I conceive is, because both of them have already past their nonage, and are arrived at the age of fœcundity, being taken off branches already fruitful ; and therefore all the time spent from the springing of the seed till its maturity is cut off from their lives, which is no disadvantage to the planter, the seed-plants remaining all that time unfruitful. 2. Suppose it were so as is said, the suddenness and copiousness of their bearing will abundantly compensate the shortness of their duration. For those, that last longer, are longer before they come to bear, and till that time they do unprofitably cumber the ground ; whereas these are profitable soon after the time of their first setting ; and when they come to be effete, they may then be cut down, and others planted in their room."

#### A DISCOURSE ON THE SPECIFIC DIFFERENCES OF PLANTS.

Having observed, that most herbarists mistaking many accidents for notes of specific distinction, which indeed are not, have unnecessarily multiplied beings, contrary to that well



known philosophic precept ; I think it may not be unuseful, in order to the determining of the number of species more certainly and agreeably to nature, to enumerate such accidents, and then give my reasons, why I judge them not sufficient to infer a specific difference.

First then, such accidents are either of the whole plant or of the root, or of the stalk, or of the leaf, or of the flower, or of the fruit, or of the seed.

1. Of the whole plant, difference of magnitude from what is usual : so in Gerard's and Parkinson's herbals we find many plants put down for distinct species, which themselves confess to differ in no other point, than being in all parts less or greater than others of their kind before described. To which I might add difference of scent and taste, for which they make a sort of wormwood, different in kind from the common, calling it *absynthium insipidum & inodorum*.

Accidents of the root mistaken for notes of specific difference are, first, diversity of colour ; instances whereof we have in carrots, turneps, and radish ; the root of the first, besides the usual colour, being found sometimes of a dark red or purple, sometimes white ; that of the second sometimes yellow ; that of the third, sometimes white, and sometimes black. Secondly, diversity of figure observed in turneps ; which are sometimes long, though commonly round-root.

3. Differences of the stalk are its degenerating in many plants into a broad and flat figure, or varying its number of angles, as in purple loose-strife.

4. Accidents of the leaf are 1. Variegation, painting, stripping, or gilding. Few plants there are but their leaves will now and then happen to be thus painted : but those, that are most prized, and charily nursed up in gardens, are painted holly, alaternus, box, rosemary, bittersweet, sage, hysop, mint, marjoram, tansy, melilot. 2. Curling of the edges of the leaves, observed in lettice, endive, mint, parsley, tansy, garden-cresse, hart's-tongue. Though in this accident, I confess myself not fully satisfied, that it is not a note of specific distinction.

5. Accidents of the flower are, 1. Variety of colour, as white or carnation, in such as are naturally blue, red, or purple : scarce any plant of such a coloured flower but is sometimes found with a white one. Here by the by we may take notice, that plants of yellow flowers seldom change colour, growing wild, tho' in gardens sometimes they do, as I found in my own garden, in yellow-flowered moth-mullein, the seed whereof sowing itself,

gave me some plants with a white flower. I never yet observed any one of the numerous family of hawkweeds to vary the colour of the flower. Besides these diversities of colour common to many flowers, there are other almost infinite varieties in July-flowers, tulips, anemonies, lark-spurs, columbines, bears-ears, poppies, stock gilliflowers and others.

2. Multiplicity of leaves, or doubleness of the flower; of which instances are infinite. Yet some whole tribes of plants were never, that I know of, observed to produce double flowers; as for example, the umbelliferous, verticillati and papilionaceous kinds.

3. Gemination of the flower, in such as we call hose in hose, which is a variety, for ought I know, peculiar to primroses, cowslips, and paigles.

4. Nakedness of the flower in such as have it usually radiate, as is observed in camomile, mayweed, feverfew, and the like.

5. Fistulousness or hollowness of the flower-leaves in such as have them usually flat, as is seen in the double-daisy and African marygold.

6. Proliferousness of the flower in childing daisy, scabious and other plants with a compound flower.

7. Accidents of the fruit are differences of magnitude, taste, figure, colour which are in apples, pears, and plums, almost infinite.

Lastly, accidents of the seed are variety of colour observable in the seed of millet, which is found of a yellow and golden colour; of maiz or Indian wheat, which is sometimes spadiceous; of common beans, which are sometimes red; and of kidney-beans, which are of many differing colours.

Having now enumerated the accidents, it remains that I give my reasons, why I judge them not sufficient notes of specific distinction.

First, as to the difference of magnitude; though I grant there are certain measures or bounds of littleness and greatness, which neither plants nor animals of the same species can exceed or fall short of; as, for example, a sheep can never come to be so big as an elephant, or so little as a mouse; nor a gooseberry-bush so tall as an oak, or so low as millegrana: yet is there a very great latitude in point of magnitude between plants of the same species, of ten sometimes to one, which yet is wholly to be imputed either to the richness or poverty of the soil, the moistness or drought of the season, the coldness or heat of the climate, or some other such like external circumstances, and



not to the specific nature of the plant : which is evident in that, if you take the seed of the smallest and poorest plant in its kind, provided it will admit culture, and sow it in a rich soil, you shall soon get an offspring ten times as great as the mother-plant. Nay, take the root of a perennial and removeable plant from off a cold barren mountain, and set it in a fat warm garden, it shall attain twice the stature and dimensions, which it would have been confined to, had it remained in its natural place. No less difference is there, in this respect, between animals of the same species ; we having in England of sheep from five to fifty pounds a score, and of beeves from three to twenty pounds a-head. And for horses, I have seen many in New Wales, that for bigness did not exceed some dogs ; and for price were rated at no more than half a crown or ten groats a-piece.

2dly, Variegation of leaves in gilded box, rosemary, and the like, is so far from being a mark of specific difference, that it is only a symptom of a morbid constitution of such plant, induced by the application of lime, rubbish, or other mixture to the root of it.

3dly, Diversity of colour in the flower, or taste in the fruit, is no better note of specific difference in plants, than the like varieties of hair or skin, or taste of flesh in animals ; so that one may, with as good reason, admit a blackmore and European to be two species of men, or a black cow and a white to be two sorts of kine, as two plants, differing only in colour of flower, to be specifically distinct ; such varieties, both in animals and plants, being occasioned either by diversity of climate, and temperature of the air, or of nourishment and manner of living.

1. What influence diversity of climate, place, or temperature of the air may have as to the alteration of these qualities, appears in many animals, which on the Alps and other high mountains, as also in those cold and northern countries, where the earth for more than half the year is continually covered with snow, are not rarely found white, though naturally of different colours : as for example, bears, foxes, hares, ravens, blackbirds. I know not, whether I ought to refer to this head, or that of the diversity of nourishment, the difference between English and Flemish horses ; and between our English Lancashire and Sussex beasts, of which the former have fair and well spread horns, the latter small and crumpled ; and, if out of Lancashire you translate these cattle into Sussex, their race by degrees will degenerate, and come to be of the shape of the natives.

2. The like, and greater, influence hath the diversity and



plenty of food, and different manner of living, as is manifest in domestic animals ; for example, swine, ducks, and geese, which do frequently and almost infinitely vary their colours ; whereas the wild, of those kinds, retain constantly the same, and not their colours only, but also the tastes of their flesh ; it requiring no very critical palate to distinguish by the taste, of flesh of tame and wild fowl : nay, it hath been told me for a truth by persons of good credit, that there is a pasture on a hill called Haselbedge, near Little Hucklow in the Peak of Derbyshire, which will turn the hair of all kine, that feed upon it, in three years time to a grey colour. Of all other animals, dogs are by these circumstances most diversified, insomuch, that many animals of different species differ not more in shape, magnitude, colour, and several other accidents, than they do. Now, if diversity of food, climate, and such like accidents, may effect such differences among animals of the same species, much more may they among plants, which are less free in the choice of their nourishment, and constantly affixed to the place where they chance to spring up.

4. I prove in general, that none of the forementioned varieties are distinct species, because they will spring frequently from the seed of the same individual plant.

5. Because by seed they will not propagate their kind, but give you plants of the usual figure and colour ; the only sure way to propagate such plants being by off-setts from the root, if they be bulbous, or by slips and branches, if others.

6. Many of these varieties, if they stand long in one place without culture, will by degrees degenerate, becoming of double, single-flowered, and changing from rare to common colours. I might add, as a further argument, that I have observed on the same root, for example, of a stock gillyflower some flowers single and some double.

But, because these varieties of flowers, for their beauty and rarity, are highly prized, and desired by the curious ; and those of fruits do no less gratify the palate than these the eye, it were desirable to know certainly, how such varieties might be produced. First, one means to advance plants from single to double flowered is by frequent removals. Laurembergius saith,\* that he hath often tried in julyflowers, and found, that single ones, by being removed first in the spring, then in the autumn, and afterwards again the spring following, and not permitted to

\* *Horticul.*, lib. 1. cap. 28. § 3.

flower in the mean time, have all come to bear double flowers.

2. One means to diversify the colour of the flower is, by watering them only with water deeply tinged with the colour you would have the flower to be of. Laurembergius, in several places of his book *De Horticultura*, inculcates this experiment, lib. 1. cap. 31. § 5. Item, cap. 19. § 10. and cap. 13. § 6. he thus prescribes the manner of making it: Fill a vessel of what size or fashion you please with very fat earth, dried in the sun or sifted, and therein plant a slip or branch of a plant bearing a white flower (for such only can be tinged); use no other water to water it with, but such as is tintured with red, if you desire red flowers, with green, if green, &c. With such coloured water water it twice a day, morning and evening, removing it into a house by night, so that it drink not of the morning or evening dew for three weeks space. You shall (saith he) experience, that it will product flowers tintured, not altogether with that colour, wherewith you watered it, but partly with that, partly with the natural.

3. The most sure and facil way to get plants different, either in colour or multiplicity of flower, is to sow the seeds of those plants, of which you desire such varieties, in a rich soil, or one different from what is natural to such plants when wild. For, if you sow the seed, for example, of a single julyflower in good ground, among many that bear single flowers, it shall give you some roots, that yield double, and some of different colours, from the mother-plant, which you may afterward propagate by the slip. The plants, that are most apt to be thus diversified by sowing, are julyflowers, anemonies, lark-spurs, columbines, bears ears, stocks, and wall-flowers, primroses and cowslips, tulips, crocuses, blue-bottles, daisies, hepaticas, and violets.

As for fruits, the ready, and, I believe, only way to get new kinds is by sowing their seeds, stones, or kernels, in rich ground, or, perchance, any common ground, which will give you wildings, bearing fruit of a different figure, colour, magnitude, or taste, from the tree of which they came, whose tastes may be mended and improved by culture and insition. But that by insitions only new species of fruits may be produced, is to me incredible, I having hitherto embraced, as an undoubted maxim in planting, that the fruit always follows the cyon.

By this way of sowing may new varieties of flowers and fruits be still produced in infinitum, which affords me another argument to prove them not specifically distinct; the number of species being in nature certain and determinate, as is generally acknowledged by philosophers, and might be proved also by



divine authority, God having finished his works of creation, that is, consummated the number of species, in six days.”\*

Meanwhile Ray, as he informed his correspondents, had been working hard to get Willughby's great work on Birds ready for the press. The matter was taken up by the Royal Society, and at a meeting of the Council on June 17, 1675, it was ordered that a treatise intitled *Francisci Willughbeii de Middleton Armigeri; quondam e Societate Regia, Ornithologia*, be printed by John Martyn, printer to the Society. At the next meeting on June 24, Mr. Willughby's *Ornithologia* was licensed, and by December 9 the printer delivered a copy “printed at London, 1676,” which was duly exhibited by Oldenburg at the meeting on that day.

So highly was this *History of Birds* esteemed that in the dedicatory epistle to the *Philosophical Transactions* of February 1675-6, it, with the *History of Animals* then in preparation were described as “two of the fairest volumes of Nature's Book next approaching to the *System of Man's Fabrick*.”

The contemporary account of this classic work, embellished with a large number of engravings contributed by Emma Willughby, fills four pages and a half of the *Transactions*, and the preamble is well worthy of the authors:

“As the person that hath reviewed, methodized and supplied this work, Mr. *John Ray* hath given to the worthy and learned author thereof his just Elogy in the Preface; so we cannot but very thankfully acknowledge not only the industry, care and accuracy of the said person in digesting and perfecting it, but also the bounty of that Excellent Lady, the authors relict widow, enriching the same with so vast a number of elegant and costly figures; whereby she hath indeed immortalised herself as well as her Deserving Consort, and manifested to the World, that in a time when many stain their lives by unworthy pleasures, she knew how

\* Birch, *History of the Royal Society*, iii, pp. 162-173.

to adorn hers by the exercise of ingenuity and vertue : In the doing of which, as she hath put a lustre upon herself, that makes her outshine many of her sex ; so she hath raised in us very great hopes, that she will continue the same nobleness in the publication of the rest of the *History of Animals* mentioned in the *Preface*.”

In May of 1675 an author whose initials were A. I. communicated his ideas about the Bladders of Air that are found in Fishes, a subject in which Robert Boyle was also interested, and which called forth a letter from Ray, who was continuing to live at Middleton, to Oldenburgh. The original is still in existence.

**55.** *Royal Society Letter Book*, No. 17.

FOR HENRY OLDENBURGH Esquire secretary to the Royall Society at his house in the Pell-mell, London.

(<sup>IV</sup>/<sub>25</sub>)

MIDDLETON, June 22, 1675.

Sir,

I was much pleased and satisfied with the ingenious conjecture I found in your *Transactions* of May last, *pag.* 310, concerning the swimming Bladders of Fishes, and persuade myself that the author thereof hath hit upon their true use, viz. to sustain or keep them up in any depth of water. For 1. It hath been observed by some, and I find it in Mr. Willughby's general notes of Fishes, that if the *Swimming-bladder* of a fish be pricked or broken, such a fish sinks presently to the bottom, and can neither support nor raise up it self in the water. 2. Flat-fishes, as *Soles*, *Plaise*, &c. which lie always groveling at the bottom, have no *swimming-bladders* that I could ever find. 3. In most fishes there is a manifest channel leading from the *Gullet*, or upper orifice of the stomach, to the said bladder, which without doubt serves for conveying air thereinto, as may easily be tried by anyone that pleases. But though air may be received into the bladder, yet there is a valve, or some other contrivance to hinder the egress of it, so that you shall sooner break the bladder than force any air out by this channel. Yet in *Sturgeons*, Mr. Willughby hath observed, that pressing the bladder, the stomach presently swelled : So that it seems in that fish the air passes freely both ways.



Possibly the fish while alive may have an ability to raise up this valve, and let out air upon occasion, which yet I doubt of, because other animals have no such faculty of opening any valves made to stop the reflux of fluids. But I verily think there is in the coat of this bladder a musculous power to contract it when the fish lists: For, in many fishes it is very thick and opaque, like the coat of an artery (which hath, as Dr. *Willis* observes, such a muscular faculty) as for example, in all the Cod-kind; in some, *v.g.* the *Hake*, call'd in Latin *Merlucius*, it is inwardly covered with a red carneous substance, which I take to be musculous flesh; in others it is forked at the top, and to each horn hath a muscle affixed. Now the musculous force need not be great, being still assisted by the water, as the fish descends; the pressure of the water being much greater at the bottom, than at the top, as appears by the ascending bubble. But whereas it is said, Perhaps the fish can by its sides or some other defence keep off the pressure of the water, and give the air leave to dilate itself: It may be objected, if it can do so, what needs then any air bladder? The cavity of the abdomen may serve the turn. To which I answer, that this power of dilating the *abdomen* by the muscles may assist fishes to rise, whose natural place is towards the bottom: And the air compressed in the bladder dilating it self as the fish ascends, facilitates the action of the muscles. But those fishes that descend by contracting the bladder, letting the *contracting muscle* cease to act, will rise again of their own accord, the air within dilating it self; as we see in glass-bubbles, by compression of the air in them descending, which as soon as the force is removed, ascend without more ado.

Besides the flat fishes I before mentioned, all the cartilagineous kind, as well flat as long, want swimming-bladders: What course they use to ascend and descend in the water, I know not. Many of the eel-kind (not all) have swimming-bladders, yet can they hardly raise themselves in the water, by reason of the length and weight of their tails: I suppose, the air-bladder being near their heads, helps them to lift up their head and fore-part. Great diversity there is of swimming-bladders in respect of figure, substance, situation and connexion in several fishes. But not being able to give you any reasonable account of each, I shall forbear to add any thing further of them.

If you hold correspondence with Monsieur Marchand at Paris, I pray tender my service to him & enquire of him, whether he received ye Latin letter I sent to him, because it is now some

moneths since I wrote, & I have received no answer. I take leave & remain,

Sir, Your very humble servant,

JOHN RAY.

[*Philosophical Transactions*, No. 115, p. 349.

This letter was read on July 1.

The next paper by Ray was not printed in the *Philosophical Transactions* until some years after his death. Its title implies that Ray revisited Italy in the winter of 1683, and attended the lectures of Professor Domenico di Marchetti at Padua—a fact that has not been hitherto recorded by his biographers, who assume that he resided at Black Notley from 1679 to the end of his life. However that may be, the very full report that he has given of the method of dissecting a body and his other anatomical observations are only what we might expect of a man who has been described by Cuvier as “the first zoologist who made use of comparative anatomy.” Marchetti was then at the height of his fame as an anatomist. Ray’s paper, covering eighteen pages, is here greatly abbreviated.

Anatomical Observations *made at Padua by Mr. Ray. In Corpore dissecto Patavii a Marchetti observata, 10mo Decembris 1683, S.V.*

Eodem modo quo alii Anatomici dissectionem exorsus est, Abdominis nimirum cutem in crucis formam secando, umbilico tamen intacto.

*Splen* in hoc cadavere praegrandis ultra naturalem molem : Hoc illae ebriositati assignabat. *Colon* in hoc cadavere peritoneo adhaerebat. . . . *Cystis fellea* arteriam habuit grandissimum, venas parvulas. Observasse se dixit ubi arteria magna est, ibi venam esse parvam quae ei respondet, et vice versa : *Non credo.* . . . Se [*i. e.* Marchetti] nunquam potuisse invenire neque credere dati ullum commune receptaculum chyli : *Experientia mea contrarium evincit.* . . .

Se vidisse venas lacteas in mesocolo ad intestina sparsas ; quod proculdubio verum est. *Verae nobis visae.*



16to Decembris. Ostendit Musculos pectoris. . . . Observavit insuper ductum Thoracicum unum ramulum mittere ad glandulam parotidem.

18vo Decembris. Praeparavit Musculos dorsi . . . capitis et colli.

19no Decembris. Praeparavit musculos faciei . . . cerebrum Observavit Musculos oculi.

21mo Decembris. Observavimus arteriam spermaticam . . . Musculos manûs dissecuit.

25to Decembris. We saw the [Caesarean] operation.

10 *Januarij* [1684].

In a *Hare* dissected we observed the *Intestinum rectum* of a very great length, having large *pilulae* of Dung *secundum intervalla*. I call here the Gut (so far as it had no *cellulae*) *rectum*, though indeed it had one or two convolutions.

The *intestinum cæcum* was of a vast bigness and length : In bigness it far exceeded the *Colon*, and was full of Excrement. Just at the entrance into it out of the *Ileum* was another *appendix* of a globular figure ; the *tunicæ* of it more fleshy, and fuller of Veins and Arteries than the adjoining *cæcum* ; there was also a little round hole in it. The *cæcum* towards the farther end of it was small, round, fleshy, full of Vessels, red coloured like the *jejunum* in a Man ; the inner *tunica* granulated, and this for more than 4 inches in length.

The *Spleen* was small and long, thicker at one end, it had no *Vesicula fellea* that I could find ; (*In another we found the Vesicula fellea manifestly :*) The *Kidnies* large, and the Left situate higher than the Right. The *glandulæ renales* received not their Vessels from the *Emulgents*, but from great Veins on each side going to the Loins.

The *Stomach* was full of grass (as I conjectured) which smelt like the Wax of an Honey-comb when the Honey is newly drained from it.

It was a Female, and had long *cornua uteri*, but did not *gestare* when we cut it up.

It seemed to have such a cavity under the Tail, above the *foramen ani*, as I have observed in a Badger.

I believe now that the Matter contained in the *Stomach* was *Fir* chewed small, the which the smell argued.

2nd *Januarij*.

In *Gallina montana* observavi appendices duas praelongas,

dimidium ulnae excessisse credo: Ad principium suum ubi a recto oriuntur post 3 aut 4 uncias reflectuntur seu convolvuntur, at in prima hac convolutione nulla intus excrementa continent; tum sursum juxta intestinum utrinque ascendunt, et sunt amplissimae atque excrementis plenae: Ad ingressum suum ubi intestino recto cohaerent habent velut annularem Musculum seu Sphincterem.

*Hepar* satis grande, in duos praecipuè lobos divisum. *Vesiculam felleam* nullam inveni, verum *poros biliarios* duos magnos diversis osculis non procul tamen dissitis sese in *intestinum duodenum* aperientes.

*Lien* exiguus triangularis. *Ventriculus* mediocris, musculosus, cujus interior tunica in duritiem fere corneam concreverat aliqua sui parte: *Cor* amplissimum.

In *ventriculo* et *ingluvie* summitates et germina *Abietis* frondium, quae apertae resinaceum et non ingratum expirabant odorem, materiae in Leporino ventriculo contentae simillimum.

[*Philosophical Transactions*, xxv, pp. 2302–3.

During the twelve years that had elapsed since the death of Willughby, Ray had practically recast his many notes on Ichthyology, and from them had prepared a monument worthy of his friend, just as in the next century Linnaeus edited and published the *Ichthyologia* of Artedi. Our account of the negotiations for the publication of this important work, by the Royal Society has been abstracted from the documented statements in Birch's *History of the Society*, details which certainly gain greatly in significance by being brought together.

On February 25, 1684/5, Dr. Robinson acquainted the Society, that Mr. Ray having some time since finished and fitted for the press Mr. Willughby's *History of Fishes*, would put it into his hands, to be brought to the Society.

It was thought proper, that the secretary should write to Oxford, to know how the bishop (Dr. Fell) might be disposed to take care of printing it, upon the Society's taking off an hundred copies.

On April 5, 1682, a letter from Mr. Lister, dated York, April 4, brought up the subject of the generation



of worms within the body of man, which occasioned further discourse about the various and strange manners of the production of insects ; and it was again urged that the papers of Mr. Willughby, formerly mentioned should be procured for the Society, if possible. Mr. Hill informed the Society that they were left in Warwickshire, and that if Mr. Ray should be desired to look them out, they might be had for the Society. Sir John Lowther affirmed that Sir Josiah Child was willing to deliver them to the Society.

At this period Ray's services as a referee were in occasional demand by the Society, as, for instance, on March 2, 1684/5, when Mr. Aston produced a large piece of brown sugar, that had been delivered to him by Mons. Justel. It was said to be made by the savages of Canada, who at the time when the juice rises in the Maple (l'érable) let it out, and evaporated it to an eighth part ; at which time it was said to be as sweet as the sugar from the sugar canes. Mr. Aston was desired to send a piece of the sugar to Mr. Ray and also to Oxford, intimating that the Royal Society would be glad to have the experiment made by them, this being about the time that the sap rises ; and that if the sap will not granulate without it, there may be used lime-water. As a matter of fact Aston did not forward the sugar, but Dr. Tancred Robinson, with whom Ray had started a correspondence in 1683, did so on March 10. His letter and Ray's prompt reply, dated March 13, have been printed.\*

On March 11, Dr. Robinson presented Mr. Willughby's and Mr. Ray's *History of Fishes* in manuscript, ready for the press, but it was put into his hands again till it could be printed. At the same meeting Mr. Aston communicated a letter to himself from Dr. Plot, dated at Oxford, March 3, 1684/5,† mentioning that the Bishop of Oxford would be willing to print Mr. Willughby's and Mr. Ray's *History of Fishes*, provided

\* *Ray Correspondence*, pp. 162-3.

† *R.S. Letter Book*, x, p. 54.

that the book were intire as to the matter and the figures, and that the Society would take off 100 copies. It was desired that Dr. Lister would give some instructions concerning the number of the figures, that would be necessary, and out of what books they might best be had.

Ray's letter of March 13 was read to the Society at their next meeting on March 18, when Dr. Robinson was desired to return thanks to Mr. Ray, and request him to send up his draughts and the references to the figures, which he judged to be the best extant. It being said that there were some plates of figures of fishes and birds made by the Bishop of Chester (Dr. Wilkins), which were in Mr. Hunt's hands, Mr. Hunt was ordered to get the plates of the fishes rolled off against the next meeting, in order that the Society might judge, whether they would be useful to this book. It was affirmed that the *History of the Antilles* was a book of small authority as being written in Europe and that the account in it of the unicorn-fish was false.

A week later, on March 25, a letter from Dr. Plot to Mr. Aston, dated at Oxford March 18, 1684/5,\* was read, concerning the *History of Fishes*, and mentioning, that Mr. Aston's last letter had much lessened the opinion concerning that history; for it had been presumed before, that Mr. Willughby had taken all the draughts from the life, whereas it was now found, that the cuts must be picked up here and there out of books; which Dr. Plot likewise found by Mr. Aston's intimation to have been done in the *History of Birds*, by comparing several birds, which he, Dr. Plot, had drawn from the life in Staffordshire with Mr. Willughby's, which he had found so unlike, that he thought now to have some of them engraven anew. He remarked also, that the Bishop of Oxford could not resolve or determine any thing about printing the book there, till he had seen what it was; and that therefore those draughts, which were ready, should be sent thither; and that his

\* *R.S. Letter Book*, x, p. 54.



lordship thought, that but one hand should be employed in the engraving the plates. The Society considering the uncertainty of the offer, and the length of time, that one hand would require to engrave all the plates, resolved to undertake the printing the book at their own charge, and appointed a committee for that purpose, consisting of the president, Dr. Lister, Dr. Robinson, Mr. Waller, Dr. Tyson, Mr. Ray, Mr. Hill, and Mr. Aston, or any three of them. Mr. Aston was accordingly ordered to send notice thereof to Oxford, and to desire, that the bishop would print the book for them, the Society being at the expence of the impression, and sending down the paper, if necessary.

The President of the Society, Samuel Pepys, took a deep interest in the work, contributing no less than sixty of the plates himself—a gift duly acknowledged in the preface to the work: “*Amplissimus Vir D. Samuel Pepys, Societatis Regiae Praeses, ingenuarum Artium et Eruditorum fautor et patronus eximius, qui operi illustrando exornandoque Icones plurimas ad Tabulas usque sexaginta, privatis impensis et proprio aere sculptas, raro magnificentiae exemplo largitus est.*”

Very naturally the book was dedicated to him.

Further proposals and considerations about the printing of the *History* were laid before the Society on April 1; and a letter from Mr. Ray to Dr. Robinson was read, returning his thanks to the Society for their intentions to print his book and some other things relating thereto. On the same day Ray again wrote to Dr. Robinson a letter, dated April 1, 1685, which was read at the meeting on April 8,\* and is printed below on p. 142. It referred to the *Lampetra* and *Finscale* of Dr. Plot, said to be fishes undescribed: a part about the making of sugar out of the juice of maple was as follows:

A friend and neighbour apothecary, whom I employed, yesterday, brought me the effect of his boiling the juice of the greater maple. Having boiled as high as an extract, he found

a whitish body somewhat like brown sugar, and tasting sweet, but withal of a woody relish ; immersed in a body of the colour, and consistency, and taste too of molosses. Upon curing I do not doubt we shall have after the molosses is separated, a perfect sugar ; but in very small quantity, not above an ounce from a gallon of liquor. Possibly, nay likely, afterwards, when the liquor begins to run thick near its ceasing, it will yield a greater proportion of sugar. When he hath cured it, I will give you a farther account of it, &c.”

[Ray's letter No. 72.]

In the meantime the printers at Oxford seem to have been going into the matter of the printing, for on May 20 Dr. Plot wrote concerning the character to be employed in the *History of Fishes*, some specimens of which being viewed were well approved of ; and it was recommended to him that there might be a border with the Society's arms.

Dr. Robinson also communicated to the Society a draught of proposals to be made for printing Mr. Ray's *General History of Plants* ; which were read and approved to be printed in that form, the secretary drawing up a short attestation, and signing it with the liking of Dr. Lister, the Vice-President ; the members present declaring that when the book should be finished, they would be ready to give a farther and larger testimony of the esteem which they have of so learned a member.

May 27 : Several of the members of the Society being willing to give one or more plates to the *History of Fishes*, now printing at the Society's charge ; it was desired that they would send in their money by Mr. Hunt to the treasurer (a guinea being computed to be the moderate rate of each plate) to the end, that their names might be written on their plates as they came to be engraved.

On June 24 proofs of six plates of the *History of Fishes* were produced, and a copy of a letter of Dr. Lister to Mr. Ray\* containing some observations about birds, which might be added to the *Ornithologia*, was

\* *Letter Book*, x, p. 184 ; *Phil. Trans.*, No. 175, p. 1159, September and October, 1685.



read. More plates of the *History of Fishes*, which had been engraved at Oxford, were exhibited on July 8. Among the contributions offered from various sources was an account of a monstrous fish, that had been communicated on June 29 by St.G. Ashe, secretary of the Dublin Society. He was desired to send a drawing over to London that it might be communicated to Mr. Ray.

On February 3, 1685/6, it was agreed that Sir John Hoskyns, Dr. Gale, Dr. Lister, Mr. Hill and Dr. Tancred Robinson be a committee to consider of the disposal of the *History of Fishes*. On the 10th, the debate about the *History of Fishes* being entered upon, it was alleged by Mr. Aston that the book being printed at Oxford, and the plates at London, as likewise the *Appendix* there could be no fraud in the printer at Oxford. Against which it was objected that the cuts being designed for a book apart, any number of the books that might be in the printer's hands might by that means be made complete. The Council then agreed with their Committee, that they could not proceed to make any disposal of the *History of Fishes* till they should hear from Dr. Plot, and have security from Mr. Hall the printer, that he had printed no more than the number which the Society paid for.

On February 17 Mr. Musgrave's letter of January 31 was read, and the paper inclosed, being of some rare plants found in North Wales, was delivered to Dr. Robinson to see whether, as it was pretended, those plants were omitted in the last edition of Mr. Ray's Catalogue of English plants.

The *History of Fishes* was again the subject of letters from Dr. Plot and Mr. John Hall on March 3. It seemed to the Council that the answer of Dr. Plot argued some discontent in him, so they thought fit to order a letter to be written to him to satisfy him of the respects of the Society, and to remove from him all jealousies and misunderstandings about the affair of that book. It was also ordered that the committee

appointed to consider of the *History of Fishes* do proceed therein, and that according to their direction a letter be sent to Mr. Hall. On March 10 Mr. Hill gave in a paper, containing some amendments and additions to be made in the plates of the *History of Fishes*, sent from Mr. Ray. It was ordered that Mr. Halley inspect the correction of the plates to be amended by Mr. Hunt.

Mr. Henshaw moved that the President should desire Dr. Lister, Dr. Robinson, Mr. Aston and those of the committee appointed by the Society on the 25th of March, 1685, to manage the affair of printing the *History of Fishes*, to give him a meeting at Gresham College, to confer with him and the Council about what had been done in the matter referred to them: which was accordingly ordered for the Wednesday following, March 17, at eleven o'clock in the morning.

Letter from PEPYS to LISTER. [*MS. Lister* 35. 1686.]

Sir,

Wheras by an order of the Royall Society made March the 25th, 1685 yow were appointed of a Committee for managing the business of Mr. Ray's Book of Fishes; these are to desire yow to meet mee and the Councill of the saide Society, att Gresham College on Wednesday the 17th of March att 11: of the Clock: that time being sett aparte to consider of the Charges of the saide Book.

PEPYS, P.R.S.

For Dr. Martin Lister.

On the appointed day Dr. Lister at the desire of the Council declared, that the order for printing no more than 500 copies of the *History of Fishes* was given by the direction of the Committee, to whom that business had been referred. He said likewise that it was himself who had brought the plates and agreed for the price of engraving. As to the paper Mr. Aston declared that he brought one Mr. Mills, a stationer, to Mr. Hill who promised that he should be paid for the paper



of the book, it being to be the same paper with that on which Dr. Plot's *History of Staffordshire* was printed, and to be afforded at seven shillings a ream. But that that parcel of paper not holding out, it had been supplied with a better sort; for which the said stationer was to have eight shillings and sixpence a ream. The Council being of opinion that it was high time that the money due for the paper, printing and other charges of the said book should be paid, ordered that the committee appointed on the 13th of January preceding, for auditing the treasurer's accounts, should meet on the Wednesday following before 11 a.m. and make a report of the state of the Society's cash to the Council then to sit.

At a meeting of the Council of the Royal Society held on April 21, 1686, two reports were read from the Committee concerning the state of the account of the *History of Fishes*; the substance whereof was—

	<i>l.</i>	<i>s.</i>	<i>d.</i>
That there had been paid for engraving the plates.	232	11	7
By an account allowed Dr. Plot . . . . .	3	7	8
By an account allowed Mr. Aston . . . . .	11	0	0
More to Mr. Paulet . . . . .	51	16	6
More to Mr. Hills . . . . .	3	0	0
More to Mr. Clerk . . . . .	6	6	6
Remains to be paid to Mr. Hills, stationer . . . . .	42	15	0
To Mr. Hunt for engraving and designing, if the council shall think fit. . . . .	7	10	0
The several incidental charges . . . . .	1	12	9
<hr/>			
Total of the charge. . . . .	360	0	0

And supposing the number of the books designed, 500, to be but 480 compleat, they will stand the Society in fifteen shillings each book, which they propose as a price for all such persons as have given a plate to the book.

All other persons who are or are not of the Society, and who gave no plate to the book, to pay twenty shillings.

	<i>l.</i>	<i>s.</i>	<i>d.</i>
Besides which the printing a sett of figures upon paper of fifteen shillings per ream amounts to	0	5	8
Upon a better sort at twenty two shillings per ream	0	8	0

	£	s.	d
So that to a benefactor the whole book will be,—			
in the worst paper .	1	0	0
In the best paper .	1	3	0
To the rest,—in the worst paper . . . .	1	5	0
in the best paper . . . .	1	8	0

Likewise that Mr. Hunt for his encouragement to look after the printing the figures may be allowed to take sixpence more for each book of the buyer, provided there be nothing demanded of the treasurer.

The Council then agreed with the Committee as to the price, and ordered that Mr. Hunt should deliver the books at the rates above written, viz. to benefactors at 15s. per book, and to all others at 20s. per book, and besides to take 6*d*. more of the buyer upon each book for himself.

It was ordered that the bill of Mr. Hills, the stationer, be examined by the Committee, and that the treasurer pay what they shall think due to him. That Mr. Ray be presented with 20 copies of the *History of Fishes* unbound; and that Dr. Gale be desired to signify the same to him, and to return him the thanks of the Society for his trouble and care. That Mr. Lister, Dr. Robinson and Mr. Aston, who have been principally concerned in the affair of printing the *History of Fishes*, have the thanks of the Society for their pains and trouble in that matter.

May 5: A letter\* of Mr. Ray to Dr. Gale, dated at Black Notley May 3, 1686, was read, returning thanks to the Society for the 20 copies of Mr. Willughby's *History of Fishes* presented to him.

June 9: Monsieur Bayle wrote to Sir John Hoskyns a later letter dated Rotterdam June 8, 1686,† returning thanks for a copy of Willughby's *History of Fishes*.

June 30: Ordered that a copy of the *History of Fishes* of the best paper curiously bound in Turkey

\* *Letter Book*, x, p. 308.

† *Ibid.*, x, p. 316.



leather, with an inscription or dedication therein, as likewise five others bound also, be sent to the President [Mr. Pepys].

July 7: Mr. Faithorne, the bookseller, presented the Society with the first tome of Mr. Ray's *Historia Plantarum* of the best paper fairly bound.

July 28: It was ordered that Mr. Hunt be paid 7*li.* 10*s.* for drawing and engraving several of the figures in the *History of Fishes*: and that Mr. Hamerton's bill for printing off the cuts of the *History of Fishes* be paid: and that the copies of that book be left with several booksellers to be disposed of; and that as good a bargain as possible be made with the booksellers, not exceeding one shilling a book.

But the publication of the great work had so depleted the finances of the Royal Society, that no ready money was available for paying the stipends of the officers. Under these circumstances the Council on February 9, 1686/7, desired Mr. Hooke to write to Amsterdam to a bookseller of his acquaintance there about the disposal of the *History of Fishes*. He was to agree for 400 books at 25*s.* a book, whereof two-fifths was to be paid in money, the rest in exchange of such other books as might be thought requisite for the Society's library.

But still the sales do not appear to have reached the expectations, so the Council resolved to pay the arrears of salary due to the officers in kind in lieu of cash. Hooke and Halley were the chief sufferers. On July 6 the question being put whether Mr. Halley should have fifty copies of the *History of Fishes* instead of the fifty pounds ordered him by the last meeting of the Council, comprehending the twenty books formerly put into the hands of Mr. Smith, the bookseller, it was determined by ballot in the affirmative. And the question being put whether Mr. Hooke should have the arrears due to him by a former order of June 16, 1686, paid him in like manner in copies of the *History of Fishes*, it was ballotted and allowed. Halley

appears to have acquiesced in the arrangement, but Hooke wisely "desired six months time to consider of the acceptance of such payment," for he well knew that even a valuable book is not worth much at the moment of issue when the market is glutted. The circumstances of the publication of his own *Micrographia* would still have been fresh in his memory.

It was ordered that Mr. Halley receive a gratuity of twenty other copies of the *History of Fishes*, in consideration of his arrears in the last year ending January 27, 1686/7.

On June 22, 1685 another note by Ray appeared in the *Transactions*\* of the Society under the title "Concerning the French Macreuse," but as it was abstracted from his letter to Robinson for August 13, 1684, which has already been printed in the *Correspondence*, it need not be quoted again here.

### 103. *Royal Society Letter Book*, No. 18.

For Mr. RICHARD WALLER, Secretary to the Royal Society, in his absence to Mr. EDMUND HALLEY at Mr. Henry Hunts at Gresham College, London.

(MA)  
21



BLACK NOTLEY, May 19, [16]91.

Sir,

In compliance with your desires I have sent you a short Account of Dr. Plukenet's *Phytographia* not such an one as the work deserves, but as I am able to draw up: wherein if you find not satisfaction blame your own judgement for thinking me able to give it.

The learned & ingenious *Author* of these *Tables* has therein exhibited to the publick view the *figures & Tables* of many *hundred Plants*, the most part of them, as yet neither described nor figured, some described but not

\* *Philosophical Transactions*, xv, p. 1041. The word "cases" in the first line of the *Correspondence*, p. 148, is "skins" in the manuscript.



figured, others though already figured yet not well & exactly. Now a good *Figure* having this advantage of a verbal description that it conveys speedily to the mind with ease & pleasure a clearer & truer *Idea* of the thing delineated, then the understanding can with much labour & in a long time form to itself from a description, be it never so exact. The pains taken & cost bestowed in designing & engraving such plants as have already been only described, or if figured, but lamely & imperfectly, must be acknowledged to have been to very good purpose, & to merit the thanks of those who shall be assisted & eased thereby, that is the greatest part of *Herbarists*, to whom a description without a figure signifies little. The new & non-descript species may give entertainment & diversion to those of the highest form in *Botanics*, who will here meet with many plants they have not before seen, or it may be heard of. As for the *sculps* they recommend themselves to the perusal of all sorts, as well as for their beauty & elegancy, as for their exact similitude to the vegetables they were taken from or are intended to represent; which are the two only qualities requisite to the perfection of a Cut.

The *Titles* subjoined to each Table may supply the place of Descriptions, as containing certain *characteristic* notes, sufficient to distinguish the *species*, to which they belong, from any others whatsoever; so that they alone without any *icon*, if diligently heeded & attended to, might serve to lead a man into a certain knowledge of the plants.

In this work the *Reader* will find many mistakes rectified, & obscurities cleared up, which I shall not stand to enumerate; many *Desiderata* supplied. I shall instance in some few particulars.

The figure of that sort of *Artemisia* of which the *Chinese* make their *Moxa* so famous for curing the gout by *ustion*.\*

\* *Artemisia Moxa* DC. Cf. Leewenhoeck's letter of 14 May, 1677, *Phil. Trans.*, xii, p. 898.

Of the Root *Gensing* or *Ninzin* & its plant,\* growing in the Kingdom of *Corea*, so much celebrated in *China* & *Japan* for a *Panacea*.

Of the Virginian *Polyporhizos* or Snakeweed,† so much talked of for the cure of the deadly bitings of the *Rattlesnake*. This has been already figured, but not exactly.

Of the tree whose bark is well known by the name of *Cortex Winteranus*.

Add to these the figures of that rare Virginian *Harts tongue* that propogates itself by the tip of the leaf turning downwards, & when it touches the ground taking root; from whence springs up a young plant, which at last is of its own accord as it were weaned & separated from its mother, & maintains itself by its own root.

Of a sort of *Kidney-bean* from *Mevis* island which they call the *Turnep tree*, having an esculent root.‡

Two sorts of *Kidney-beans* which are not *trifoliolate*, but single leaved.

Of the top & flowers of that plant which *Lobel* inscribes *Verbascum sylvestre salvifolium exoticum folio rotundiore* erroneously giving only the figure of the leaves & lower part of it: & *Parkinson*, I know not how deceiving himself & imposing upon others, makes a kind of *Cistus*; whereas it appears to be a sort of *Salvia fruticosa*. For the rest I refer the Reader to the Work itself. Mr. Willughby's Observations concerning Insects, which were sometimes in my hands, I have long since delivered up to his son Sir Thomas Willughby, who will I suppose in time take care to publish them. So I take leave & rest,

Sir, Your most humble servant,

JOHN RAY.

\* *Aralia quinquefolia* Dec. & Pl.

† *Aristolochia Serpentaria* L.

‡ Query Yam bean, *Pachyrhizus tuberosus* Spreng.



128. *Royal Society Letter Book*, No. 19.

For his honoured friend Dr. TANCRED ROBINSON. To be left at Mr. Goodwyns at the sign of the Mayden over against St. Dunstan's Church in Fleet Street London.

( $\frac{AV}{26}$ )

B[LACK] N[OTLEY], Aug. 21, [16]93.

Saturday last I received from Mr. Smith a parcel of books, two of which I suppose were yours viz. Schwenckfeld's *Silesian Animals*, Charleton's *Onomasticon zoikon* of the 2nd Edition in folio. Whatever he may boast of his performance, he is (as you say) no better than Johnson, & did not understand Animals, nor had any comprehensive knowledge of them. *Sed vulgus noti distinguit*; & to me it is a great argument of learned men's ignorance in that History, that such a book should find so much acceptance as to come to a 2nd impression. As for his figures of Birds, they were taken most from Sir Tho. Crew's designs drawn at Montpellier, which I saw there; which were by no means exact according to the life, but humored by the Painter to make them the more beautiful. I have not yet run over him: but expect to find little in him; Schwenckfeld (I fear) will not afford much neither. This morning I read what he saith of Birds in general, which contains nothing new or not observed by me: but several old errors & mistakes. I have also skimmed over the Spitzberg voyage, contained in the parcel; neither does there occur much new there. If his descriptions be exact some new species of Birds there are; of which I shall give as good an Account as I find.

My neighbour Dr. Allen is not yet come home, so I am still to seek what was the result of your conference with him. I desired Mr. Smith to tell you what advice I had from Dr. Briggs. This morning I thought to have begun to drink our Wiley-waters. But I find either the Carrier, or he whom he employed to fetch the Waters to Burntwood, have cheated me & brought

nothing but plain spring water in stead of it, so that I am again disappointed & deferred; & fear now my drinking of waters will come to nothing.

Last week I received a letter from Mr. Paschall or Dr. Paschall, containing some ingenious observations of his, wherewith I was much pleased, & shall give you them in his own words. "Some months since I fell into a suspicion, that the causes of *Tides* at Sea do also continually exert their power in other places, though the effects thereof may not be so sensibly perceived on the solid as the fluid parts of this *Terraqueous* globe. That I might in the best way I could think of, make some trial towards a discovery of the truth therein, I took this method. First I divided the *Νυχθήμερον* into 4 senaries of hours. The first consisted of 3 hours before the *Southing* of the *moon* & 3 after the second of the 6 hours following, & so the 3d & 4th contained the two remaining quarters of the natural Day. I next betook myself to observe births & deaths, in our own kind, as also in other species of *Animals*, whether they fell out indifferently in any of these four senaries: And I found none that were born or died a natural death in the 1st & 3d senaries, which I take liberty to call first & 2d tides, but everyone either in the 2d or 4th senaries, which I call 1st & 2d Ebbes. I then proceeded to make observations in the motions of diseases, which I could the better do, because I had some in my family visited with Agues. Here I found that the tumult of the fits generally lasted all the Tiding time, & then went off in gentle kindly sweats in the Ebbs. I then went on to take notice of the *sex res non naturales*, & alterations of the weather, & such accounts as I could meet with of *Earthquakes* & sundry other things: and I have yet met nothing to hinder me from laying down this as a maxim, That motion, vigour, action, strength &c. appear most & do best in the *tiding senaries*; & that Rest, relaxation, delay, dissolution belong to the *ebbing senaries*." Thus far Mr. Paschall. This theory methinks bids fair for an Account or reason of the difference of the time of day



of the beginning or of the coming of Ague-fits: only I think Ague-fits generally prevent, whereas the southings of the moon postpone. Another objection I have against it, that those that die of Agues are by Physicians observed to die always in the cold fit, which according to him happens in the Tiding senaries, in which according to him no deaths happen but in the Ebbs.

I thank you for your observations. I wish we had a more full description & history of the Animals therein mentioned out of the Leyden museum. That Dr. Lister's Silk-tail is nothing else but the *Garrulus Bohemicus* of Aldrovand,\* I am fully satisfied. What Dr. Brown's *Silerella*† may be I am not resolved, but do believe it may be one we have described under some other name, & therefore thought not fit to enter it, lest I should *cruce infigere Lectori*.

Dr. Plot's *Colymbus cristatus cornutus barbatus*‡ is, I doubt not, the same that is described in the 5th place in Mr. Willughby's history, whatever he may write. But enough for this Paper from

Sir, Yours in all offices of love & service,

JOHN RAY.

This letter should have been sent last Post, but the boy neglected to call heer as he passed by. I have other things to write, but this Paper will hold no more. I have this day again sent for the waters. This cool weather I find affects my legs already. I hear Dr. Allen is returned, but I have not yet seen him.

During Dr. Hans Sloane's tenure of the Secretaryship of the Royal Society (1693–1709) many letters passed between him and Ray, and a large number of these have been preserved among the Sloane MSS. in the British Museum and have been printed by the Ray Society in 1848. Two of his communications were

\* Waxwing, *Ampelis garrulus*.

† Bearded Tit, *Panurus biarmicus*, discovered by Sir Th. Browne.

‡ *Podiceps cristatus*.

printed in the *Philosophical Transactions*. When in November 1692 Sir Richard Bulkely advocated the cultivation of maize on economic grounds, an epitome of his paper was printed together with the following brief note supplied by Ray.

I have not much to say. He hath made a commendable essay, but whether it will turn to account to plant Maize in Ireland.

If the *Maize* be equal in goodness to peas, and an acre planted with it, it will certainly yield more than one sown with pease, without impoverishing the land, then indeed it will be advantageous to plant it; but if only an equal quantity, then tho' one grain should yield 1000 fold, all the advantage will be in the difference of the seed, which is not very considerable; and which the compendium of sowing above setting may in some measure countervail.

By Sir *Richard's* description of it, I am confirmed in my opinion, that there are two really distinct species of *Maize*; for what I have seen cultivated in gardens, and have myself planted, ariseth to double the stature he ascribes to this, that is, 7, 8, or 10 feet; and besides, with us, never brings the seed near to perfection. But that I have seen planted in the fields in *Germany*, is of about the same height with Sir *Richard's*, and ripens the seed. *Lobel* also acknowledges two sorts thus differing.

[*Philosophical Transactions*, xvii, p. 928.\*]

## 176.

*Part of a Letter from Mr. John Ray F.R.S. to Dr. Sloane, dated June 30, 1697 communicating Two Observations, the one concerning the Effects of a poysonous Root, the other concerning the Vertues of the Leaves of Hemlock.*

Since I understand you are concerned in the *Philosophical Transactions*, I shall send you an Observation or two I lately received from Dr. *Nathaniel Wood*, a physician in Kilkenny in Ireland; which if you think fit, may be thereinto inserted. The first is this: A certain woman eating by mistake some roots, as he supposes of common *Hemlock*, among parsneps, was immediately

\* Error for p. 938.



seized with raving and madness, talk'd obscenely, and could not forbear dancing, on which exercise, she was so intent that she would willingly have given her cow for a bag-pipe.

Thus she continued for some time, till at length she was taken with *Epileptick* fits: Of which distemper being committed to my charge, she was soon cured by the common method, and has now for several years lived in perfect health. What quantity she eat is not known, but on her growing mad, some such thing was suspected, and on search a piece of Hemlock root was found on her trencher. So far the Doctor. Howbeit I am in some doubt whether it was really the root of *Hemlock*, which this woman did eat, and which had this effect upon her, and not some other: Because 1. *Jo. Bauhine*, relating two parallel stories of two several families in Montbelgard during his abode there, which were in like manner intoxicated by eating of roots, which they took to be Parsneps, and which he himself cured, is of opinion that they were the roots of wild-Cicely, commonly called by the vulgar hereabout *Cow weed*, because kine in the spring time willingly eat it, by Herbalists in Latine, *Cicutaria Vulgaris*, or *Myrrhis Silvestris*: Because (saith he) the roots of it are more like to parsneps, than those of *Cicuta* or *Hemlock*, and because this plant was abundantly more frequent in the gardens thereabouts than Hemlock.

2. That skilful herbalist, my much esteemed friend Mr. *James Petiver* assured me, that being in company with one Mr. *Henley*, an ingenious friend and neighbour of his, he saw him eat 3 or 4 ounces of *Hemlock-Root* without the least harm, whereupon he himself was encouraged to do the like, eating about half an ounce. They tasted somewhat like the root of *Seleri*, or Sweet-smallage, and he perceived no ill effect, or inconvenience from the eating of them. 3. The common people generally believe that the roots which cause these symptoms, are no other than old parsneps, which have continued some years in the ground; and therefore call them *Madneps*. For my part, I am not yet satisfied what roots they are, and should be glad to receive satisfaction from others.

The other observation I shall give you in his own words, without making any reflections upon it. A gentleman of my acquaintance having a horse which he highly valued, troubled with that stubborn disease they call the *Farcy*, employed several usually efficacious medicines unsuccessfully. At length, one day riding abroad on this horse to take the air and being in discourse with a gentleman he met in a place where grew a great

quantity of *Hemlock*, he observed the horse began to feed thereon, but checked him at present, and was returning home ; when calling to mind that some animals are sometimes directed by what they call instinct to proper remedies, he rode back to the same place, where the horse again refused the grass, and fell aboard the Hemlock greedily, eating it up. On which within three or four days his sores dried up, and he recovered very fast. From whence it appears, that the leaves at least of *Hemlock* are not noxious to some animals, but rather salutary. The seeds also, some birds, as in our observation Bustards, will greedily eat.

Yours, etc.,

JOHN RAY.

[*Philosophical Transactions*, xix, p. 634.

In the next volume the same subject was continued by the publication of “ *Part of a Letter from Mr. Ray, F.R.S. to Dr. Sloane, giving an Account of the Poysonous Qualities of Hemlock-Water-Drop-Wort.*” [*Ænanthe crocata* Linn.]

I shall now communicate to you a story or two of the direful effects of *Ænanthe aquatica*, *Cicutæ facie succo viroso* of Lobel, which we may English *Hemlock-Water-Dropwort*, upon several persons that eat of the roots of it, sent me not long since in a Letter from Dr. *Francis Vaughan*, a learned phisitian in Ireland, living at *Clonmell*, in the County of Tipperary. This gentleman observing me, notwithstanding what Dr. Johnson in his *Gerardus emaculatus*, and Lobel in his *Adversaria* had written of the venenose Quality of this plant, to be somewhat doubtful of it in my *Synopsis Methodica Stirpium Britannicarum*, for my full satisfaction and conviction, wrote the following abstract of a history drawn up by a person, who is at present his brother-in-law, concerning the effects of it upon himself, and seven other young men, who ignorantly mistaking it for *Sium aquaticum*, or *Apium Palustre* did eat of it.

“ Eight young lads (about 30 years ago) went one afternoon a fishing to a brook in this county [near *Clonmell* in *Ireland*], and there meeting with a great parcel of *Ænanthe Aquatica Succo Viroso* (in *Irish*, *Tahow*) they mistook the roots of it for *Sium Aquaticum* roots, and did eat a great deal of them. About 4 or 5 hours after going home, the eldest of them, who was almost



of man's stature, without the least previous appearing disorder or complaint, on a sudden fell down backwards, and lay kicking and sprawling on the ground : His countenance soon turned very ghastly, and he foamed at the mouth. Soon after 4 more were seized the same way, and they all died before morning ; not one of them having spoken a word from the moment in which the venenate particles surprizing the *Genus nervosum*. Of the other three, one run stark-mad, but came to his right reason again the next morning. Another had his hair and nails fallen off ; and the third (who is my Brother-in-law, and from whom I had this account) alone escaped, without receiving any harm. Whether he eat less of this fatal root, or whether his constitution, which is to this day very athletick, occasioned it, I cannot tell. Though I am of opinion that his speedy running above two miles home, after that he saw the first young man fall, together with his drinking a very large draught of milk, warm from the cow, in his mid-way, were of singular use to him. For his violent sweating did doubtless expel and carry off many of the venenose particles, and had a better effect than perhaps the best of our *Alexipharmicks* (which you know are generally *Diaphoretick*) might have produced in this case. Besides, I believe, the draught of warm milk did act its part, by involving the acid or acrimonious poisonous particles, and rendering them unactive, and preventing their seizing the *Genus nervosum*, till they were expelled *per diaphoresin*. But this is but my conjecture, which I willingly submit to more mature judgements. This happened about thirty years ago ; but yet there are many yet alive who assert the truth of it, having been eyewitnesses of this dreadful tragedy. There was also a Dutchman about two years since, within eight miles of *Clonmel*, poisoned by boyling and eating the tops of this plant shred into his pottage. He was soon after found dead in his boat, and his little Irish boy gave account of the cause of his death to be eating this herb, which he forewarned his master against ; but in vain, the Dutchman asserting that it was good salade in his country : so that I believe he took it for *Apium palustre*, which its leaves much resemble." Thus far Dr. Vaughan.\*

Several parallel and no less tragical histories of later date, of the miserable destruction of divers persons, by the

\* The passage quoted from Dr. Vaughan was contained in a letter written by him to Ray on 26 August, 1696. The remainder of this letter was published with Ray's *Correspondence*, p. 304.

eating of the roots of this pernicious and deleterious plant, I find recorded by *Jacobus Wepferus* in his book, *de Noxis Cicutæ aquaticæ*, and in the *Miscellanea Curiosa*, Dec. 2. An. 6. *Observ.* 116.

Wherefore I think it is for the interest of mankind that all persons be sufficiently cautioned against venturing to eat of this, and indeed any other unknown herb or root, lest they incur the same fate ; and in order thereto, that such histories be made publick and transmitted to Posterity.

[*Philosophical Transactions*, xx, pp. 84-6, March, 1698.]

An account of the connection of Ray and the Royal Society may be appropriately concluded by a part of a letter published in the *Philosophical Transactions* two years after his death. The anatomical observations in the same letter have already been noted.

*A Letter from Mr. Samuel Dale to Dr. Hans Sloane, R.S. Secr. giving an Account of what Manuscripts were left by Mr. John Ray, together with some Anatomical Observations made at Padua by the said Mr. Ray.*

Herewith you will receive divers *Anatomical Observations*, that were made at *Padua*, by our late learned and most ingenious Friend the Reverend Mr. *John Ray* upon the dissection of some Humane Bodies, by that great Anatomist *Seignior Antonio Marchetti*, and do contain, besides those things which Mr. *Ray* did himself remark, divers Observations of the Operators which did not occur in those Bodies, to some of which Mr. *Ray* hath added Notes. To these are subjoined two Dissections of Mr. *Ray's*, viz. of a *Hare*, and the *Mountain Hen*, neither of which can I find published in his Works, nor hath he taken any notice of these Observations in his *Book of Travels*, although the Charge was very considerable, amounting to 284 *Livres* and 15 *Soldi* of *Venice*.

Besides these, there are in his *Adversaria* many *Observations*, *Inscriptions*, *Epitaphs*, *Antiquities*, etc. which being collected together, would make a large *Supplement* to his *Observations* already published.





SAMUEL DALE, 1731, ÆT. 72.

*(From the portrait presented to the Apothecaries' Company by the family of Dr. T. Dale.)*





Nor must I forget his Travels in our own and the neighbouring Kingdom, of which he hath left divers *Itineraries*. These may not be unuseful to our *English* Travellers, he being as careful in making Observations and Collections at home, as he was in foreign Countries.

Had his Life been protracted but another Summer, he would in all likelihood have finished his *History of Insects*, for which he had been preparing Materials divers years ; this Work being far advanced, doth not deserve to be committed to the Moths, but to be carried on by some learned and ingenious Person in that Study.

Thus, Sir, I have briefly answered the desire of yourself and others, in acquainting you with what Manuscripts Mr. *Ray* hath left, which might be useful to the Commonwealth of Learning.

I am, etc.

SAMUEL DALE.

For Ray's own account of his dissections appended to this letter, see pages 86-88.

## V.

LETTERS OF JOHN RAY TO MARTIN LISTER,  
FELLOW OF ST. JOHN'S COLLEGE,  
CAMBRIDGE.

1666 TO 1676.

THE following extracts from the original letters of Ray to Mr. Martin Lister and to Dr. Tancred Robinson have been copied from a bundle of letters now in the Botanical Department of the British Museum. The collection is inscribed: "MSS. Correspondence from and to John Ray from 1663 to 1686 found at Neatherton, Devonshire, among the papers of Lady Prideaux, by C. G. Prideaux Brune Esq. and given by him to John Davies Enys in January 1884. Presented to the Botanical Department by J. D. Enys," in whose handwriting there are copies of some of the letters.

The late Professor G. S. Boulger drew attention to this series of letters in a discourse on *The Domestic Life of John Ray at Black Notley* in 1885, printed in the *Journal of Proceedings of the Essex Field Club*, iv, 1892, p. clxiv. They were used successively by William Derham and by his wife's nephew, George Scott, of Woolston Hall, who, Derham having died in 1735, published the *Select Remains* of John Ray in 1760. After Scott's death in 1780, they passed into the possession of the Prideaux family. But evidently they were unknown to Dr. Edwin Lankester when he reprinted a portion of the letters in an abbreviated form for the Ray Society in 1848.



Martin Lister was so closely associated with Ray during the early period before his physical infirmities prevented him from travelling to London to attend the meetings of the Royal Society, that his correspondence may be considered first. Several of the earlier letters are in Latin, and Lister's first address is given as "Burwell nere Louth in Lincolnshire. To be left with Mr. [ ] at Grantham."

The first of the series dated June 9, 1666, is missing. According to an abstract by Derham it conveyed "Handsome returns of affectionate compliments," and described Ray's "journeys to Calais and Plants observed."

The references to the pages of the *Correspondence* "C." where the parts of the letters have been printed are indicated within square brackets.

## 20. MS. *Herb. B.M.* "2d *Lr.*"

These for Mr. MARTIN LISTER fellow of S. John's College in Cambridge.



Sr,

MIDDLETON, June 18, 1667.

It was my misfortune when I lately passed through Cambridge to miss of you, though to see and speak with you was the first thing in my thoughts and desires. Mr. Dent can inform you what haste I was in, three hours being all the time I could allow myself to stay, which not knowing how to have bestowed better both to my satisfaction and advantage than in your company, I was careful so soon as I came into town, to send to enquire of you.

[Arrived here . . . not yet met with. C. pp. 13-14.]

For my own part I cannot boast of many discoveries made the last year save of mine [*corner torn*]. I took my leave of you at Cambridge, I divided the [remainder] of the summer between Essex and Sussex visiting

several friends. My spare hours I bestowed in reading over such books of Natural Philosophy as came out since my being abroad, viz. Mr. Hooke's *Micrographia*, Mr. Boyle's *Usefulness of Nature Philos : Origine of forms, Hydrostaticall paradoxes*, Sidenham *de febris*, the *Philosophical transactions*, the buisness about Great-rakes,\* turning over Kircher's *Mundus subterraneus* etc. The most part of the winter I spent here in revising and helping to put in order Mr. Willughby's collections of Birds, Fishes, Shells, stones and other fossils, seeds, dried plants, coins etc., in giving what assistance I could to Dr. Wilkins in framing his tables of plants, Quadrupeds, Birds, fishes etc. for the use of the *Universal Character* : in gathering up into a Catalogue all such plants as I had at any time found growing wild in England, not in order to the present publishing of them but for my own use possibly one day they may see light, at present the world is glutted with Dr. Merrett's bungling *Pinax*. I resolve never to put out anything which is not as perfect as possible for me to make it. I could wish you would take a little pains this summer about grasses, that so we might compare notes, for I would fain clear and complete their history. Had you made a step hither when you were so near as Warwick, you should have been very welcome to me and I dare say also to Mr. Willughby, to whom I have had frequent occasion to mention and commend you.

Last week I received another Letter from you written in Latin, for which I give you thanks, and shall shortly pay you in the same coin. My stay here will not now be long. I intend this summer to travel further either northward or westward or both, in quest of plants and fishes. If you continue in Cambridge, I know how to

\* This sentence was printed in the *Select Remains* as "the Business about great Rakes," which was explained by the first editor, George Scott, and accepted by the second, Dr. Lankester, in the *Memorials of Ray*, p. 17—"They are now come into general use among the farmers, and are called drag-rakes." The reference is of course not to agricultural implements, but to Valentine Greatrix, who was said to be able to cure the King's Evil by touch, or by stroking the affected parts, whereby he was called "Greatrix the Stroker." Robert Boyle believed in him.



send to you and can give you directions from time to time how to address me. I am sorry to hear the ill news of the Dutch insolency,\* though as yet the particulars of our loss are not certainly known here. Its time now to have done, indeed should I proceed further I should scarce find room to add what must by no means be omitted, that I am,

Sr, Your assured friend and very humble servant,  
JO. WRAY.

My respects to Mr. Dent† and his consort.

**20** A and B. *Derham's abstract of "3rd and 4th Letters."*

July 4, 1667. Enq[ui]ries about Birds. Method of . . . in Bp. Wilkins' *Universal Character*. Of Insects. Setting down observations. Kircher's *Mund. subterraneus*, a poor book. Helmont. Of their Latine.

Kal. Aug. 1667. Going to Cornwall with Mr. Will[ughby]. Birds: Some Insects: Snailes: Grasses: and what [he] intends to do in Botany.

**21.** MS. *Herb. B.M.* "Lr. 6th."

These for Mr. MARTIN LISTER at his chamber in S. Johns College in Cambridge.



( $\frac{OC}{4}$ )

1 Oct. 1667.

J. Wray—D. Martino Lister suo [S.P.D.].

Literas tuas postremas X sc. Kal. Octobris datas [*corner torn*] supervenerunt aliæ duæ Mediâ villâ ad me transmissæ, quæ non parum in itinere claudicârunt. Quantam ex earum lectione voluptatem perceperim haud facile dicendo assequi possum, tum quod eximiæ

\* The Dutch fleet under De Ruyter sailed up the Medway and burnt 16 English ships at Chatham.

† Peter Dent wrote to Ray about Thornback Rays brought to London by a Mr. Mayfield in 1674. According to a passage that has been omitted from his letter as printed (*Corr.* p. 15): "Mr. Mayfield or his man is att London every fryday, when he saith, these fishes are easier to be had than here, his lodging is at the black Bull within Bishopsgate. He is acquainted with the Tamworth carrier and will undertake to send you any of these fresh into the country, and if you will desire it, he will watch his opportunity for the same."

tuæ in me voluntatis manifesta indicia exhiberent, tum quod te in eodem naturalis rei historiam excolendi proposito constanter perseverare arguerent. Cum videam te mei causa adeo sollicitum, cum res meas vel prosperas vel adversas ad te quadantenus pertinere putes, adeo ut illis læteris, his vicissim indoleas, si meipsum amem (ad quod certe faciendum sponte naturæ nimis proclivis sum) ut te quoque vehementer diligam tibi que bene esse gaudeam omnino necesse est

[Symptoma . . . non accedam. *C.* p. 17.]

imo plane contrarium sentiam, gulæ nempe et voracitati debere me pleraque omnia quæ unquam passus sum adversæ valetudinis damna et incommoda. Nec dubito quin et tu ipse, si me satis scires, juxta mecum sentire.

[Absit ergo . . . diligentiam effugerint. *C.* p. 18.]

Anatum illam sylvestrem minorem *Teal* nostratibus dictam Querquedulam autorum tuorum esse, non est cur dubites. De *Knott* Lincolnensi mihi nondum satisfacio, nec enim hactenus eam vivam videre contigit. In Accipitrum genere et universim rapacium natura ludere videtur, ut species accurate distinguere admodum difficile et impossibili proximum sit. Eadem quoque avis pro ætatis ratione pennarum colore variat: in senioribus color ut plurimum languidior in alborem tandem degenerat. Forte tamen *milvum* tuum *sylvaticum* inter Aquilas reperies. *Balbuzardes* certo Anglorum non aliud est quam *Haliaetus*. Quamprimum Gesner Ornithologiæ copia mihi facta fuerit. *Passerem aquaticum* et *harundinaceum* examinabo, ut sciam an mihi cognitus sit necne. Ejus nominis duas aues vidi, majorem et minorem, minor (ut puto ab Aldrovando *Ficedulis* annumeratur, majorem [*corner torn*] aliquatenus similis est. De *Sheldraco* tuo longirostro quod [*corner torn*] non habeo, cum autores quos consulam ad manum non sunt, nec ego vel descriptionem vel iconem *Merganseris* apud Gesnerum satis bene memini. Quod in avibus describendis accurate singularum partium structuram consideres, et industriam et perspicaciam tuam laudo. Quod de *Pico viridi* observâsti, illi ex mea observatione



cum nigro & vario utroque & *Iynge ave* (quam *Torquillam* vocant quod caput in unam partem frequenter flectat) commune est. Ejusmodi conformationis usus sane insignis, ad cossos sc. majusculos è ligno putrido educendos. Ego nempe e ventriculis harum avium disectis cossos minimo digito pares non semel exemi. Musculi quoque & cartilagine quorum ope linguas evibrant retrahuntque merentur curiose spectari. Pariter quod de *Ardea cinerea* notas toti huic generi competit, stellari nimirum, cinerea minori, alba majori minorique &c. Unguem sc. medii digiti pectinatum a sinistro latere obtinent, cujus quis usus sit per se satis patet, nimirum ut *Anguillas* aliosque pisces lubricos et læves quibus delectantur comprehensos facilius teneant, nè ex unguibus elabantur. Quod in graminibus meo rogatu perquirendis eorumque historia illustranda laboras, rem mihi pergratam facis, plurimæque eo nomine a me tibi debentur gratiæ. *Gramen* illud *aculeatum Germ.* Parkinsoni\* prope Cantabrigiam à te inventum non dissimile veri est, nam & ego in palustribus agro Warwicensi illud frequens observavi Chrysalidum tuarum infelicem exitum deploro, & prædones istos troglodytas omnibus diris devovendos censeo. De stylo tuo non est cur admodum sollicitus sis, aut censuram criticam formides: paucissimi sunt qui pari scribendi facultate pollent, expertus loquor. Ego sanè vix quicquam invenio quod merito carpam arguamve. Quinimo is est sermonis tui nitor & puritas, eæ veneres & elegantiae, tot lumina & ornamenta, tam apte disposita & sententiam pulchre illustrantia, ut nihil fere in te ad perfectam eloquentiam desiderari videatur. Cum tamen errare labi decipi humanum sit, nec te nec me nec quemvis alium erroris prorsus expertem fore unquam sperandum est. Superest jam ut promissis spem, & Catalogum piscium absolvam, cum tamen jamjam modum epistolæ excesserim, & quousque Catalogum perduxerim penitus oblitus sim, expectare oportet dum tu me ubi desierim certiore facias. Interim vale.

Dabam Notleiae Kalendis octobris 1667.

\* *Carex flava* L.

Septimana sequente Londinum redire cogito. Proximæ ergo tuæ inscribantur Joan: W. in ædibus D. Horsenoll next door to the Rose tavern in Cursitors alley, London.

**22.** MS. *Herb. B.M.* “*Lr. 7th.*”

12 Oct. 1667.

Joannes Wray D. Martino Lister suo S.P.D.

Dum adhuc in Essexia diutius moram traho, secundas à te literas accepi, quibus antequam hinc discedam respondendum duxi, nè aut expectationi tuæ aut amici officio ulla in parte defuisse videar. De literis illis Mediam villam dum ego per Cornubiam abessem transmissis, quæ periisse suspicaris, tibi satisfactum puto ex superioribus meis: penes me sc. inter cimelia pretiosissima repositæ asservantur.

[Quod veteres . . . et me ama. C. pp. 19–20.]

Dabam Notleiæ iv Idus 8bris 1667.

**23.** MS. *Herb. B.M.* “*Lr. 10.*”

These for Mr. MARTIN LISTER fellow of St. Johns College in Cambridge.



(NO  
24)

[23 Nov. 1667.]

D. Martino Lister J. Wray.

[Literas tuas . . . diu detentus fui. C. p. 22].

Literas tuas si quas ad me scribere dignaberis, ita inscribes—For J. W. at Cuckfield in Sussex to be left at Mr. Leach his house in Scroopes court in Holborn over against S. Andrew's church, London. Vale.

Londini ix Kal. Decembr: 1667.

**23 c.** *Derham's abstract of "Letter 11."*

[Ray] Is at Cuckfield in Sussex. His dear friend Mr. Ro. Barnham dies near Maidstone. Is translating Bp. Wilkins *Univ[ersal] Char[acter]*.



25. MS. *Herb. B.M.* “*Lr. 13.*”

These for Mr. MARTIN LISTER fellow of S. Johns College in Cambridge.

In his absence

Leave this with Mr. Peter Dent Apothecary in Cambridge.



( $\frac{1}{30}$ )

[26 July, 1668.]

J. Wray D. Martino Lister suo S.D.

Diu jam est, Amicorum suavissime, ex quo ullas ad te literas dedi, partim quod non certo scirem ubi commorareris, præcipue vero quod per tres menses proxime elapsos in continuo fere motu fui; quam primum enim è Sussexia Londinum redij amicorum precibus evocatus Boctonam in agro Cantiano concessi ad invisendos parentes, viduam, sorores D. Barnham\* amici mei nuper defuncti, quos ut potui consolatus post tres tandem septimanas venia & missione ægre impetratâ, denuo Londinum petii: Londino iterum post brevem quatruidi moram egressus, Essexiam ad necessitudines meas contendo; inde vix unâ exacta septimana Haslingfieldam proficiscor, ut D. F. Willughby ibi conveniam ejusque nuper nuptam uxorem videam & salutem, præsens præsentî felix conjugium gratuler, perenne gaudium faustaque omnia comprecet & voveam. Necque hîc diu substiti, sed Londinum tertium ad necessaria quædam negotia obeunda revertor. Interim tamen dum Haslingfeldæ commorarer Cantabrigiam excurri ad veteres amicos & familiares salutandos. Londino Essexiam repeto, Essexia Haslingfieldam, inde D. Willughby domum redeuntem Middletonum usque comitatus sum. Verum nec ibi pedem fixi, sed brevi interposita mora in viam iterum me do, septentriones versus cursum dirigens.

[Proxima statio fuit . . . animo habeo. C. p. 25.]  
Tu interim, si hæ [literæ] ad manus tuas pervenerint, ad

\* See p. 31 note.

me rescribas oro, meque vicissim ubi sis, ut valeas, quid agas, quem vitæ cursum insistas, (quæ vehementer scire desidero) quam primum certiores facias. Vale.

Dabam Sheffieldiæ ex æd. D. Jessop, Broomhall dictis  
7 Kal. Augusti, 1668 [i. e. 26 Jul.].

26. MS. *Herb. B.M.* “*Lr. 14.*”

These for Mr. MARTIN LISTER fellow of St. Johns College in Cambridge.

(SE)  
1

[Sept. 10, 1668.]

J. Wray D. Martino Lister suo S.D.

Quod scribis, te difficultatibus illis quibus impeditus tenebaris superatis jam pene liberum tuique compotem factum pristinam animi tranquillitatem recuperasse plurimum gaudeo, eamque ut tibi stabilem & perpetuam esse velit, Deum opt. max. suppliciter veneror. Quod tibi consulam non habeo, nisi ut eodem quo cœpisti pede pergas & institutum pertinaciter urgeas :

[Ego ex quo huc . . . adeo acrem senserim.  
C. pp. 25–28.]

Plura habeo quæ tibi alias communicanda reservo ne modum Epistolæ excedam. D. Howlett, quem tibi gratulor studiorum socium, plurimam meis verbis salutem nunties, ut & D. Dent aliisque familiaribus meis tibi notis. Hospitem meum veterem uxorem duxisse tam verum est quam quod verissimum ; quid quod ipsius uxor & gravida est & partui proxima, cui felix puerperium voveo. Quamvis non id mihi jus in te sumam ut studiorum tuum rationem exigam, quam tamen te instituere scribis non possum non probare ; nec dubito quin tu olim aliquid Musis & Apolline dignum elaborabis. Procedas ergo bonis avibus in commentariis quos de insectis meditatus es. Studiorum tuorum in hoc genere æmulum habes insignem qui industriam tuam acuat



D. Willughby. D. Charleton (ut audio) *Onomasticon* suum *zoicon* in 4to nuper edidit. Nudius tertius hinc discessit conterraneus tuus & vicinus & tuus & parentis tui (ut mihi scribis) familiaris D. South consobrinus D. Jessop, qui ad amitas suas aliasque necessitudines invisendas duabus abhinc septimanis se huc contulit. Sequentē septimana hinc discessurus sum & ipse Middletonum versus ubi literas tuas paulisper expectabo; nam ad festum S. Michaelis in Essexiam mihi denuo redeundum est. Ignoscas incuriæ scriptiōis, et siquid erratum sit condones & homini & amico. Vale.

iv Idus Septemb. 1668 [i. e. Sept. 10].

27. MS. (*not seen*). “*Lr. 15.*”

[31 Oct. 1668.]

Joannes Wray D. Martino Lister, S.D.

[Literas tuas . . . curia starem. *C.* pp. 29–30.]

Cum vero ecclesiæ mentio incidit, succurrit mihi quod te consulerem ex clausula cujusdam epistolæ tuæ male intellecta suspicor me in errorem inductum. Nempe cum scriberes parentis jussu affectum ut studia persequeris eo ipso in loco in quo nunc es, utque particeps esses colloquii, ego quoque verba illa de sodalitiō accēpi. Te sacris initiatum statim credidi, nam sodalitiū quod vocant eam conditionem requirit. At cum D. South me certiozem fecisset non eam unquam fecisse aut tuam aut parentis tui mentem et tu quoque jam scribas expectare te ut sub initium veris patris mandato ad medicinam faciendam ex Academia evoceris, alio mutat sententia. Tu facile et mentem tuam expones, et me expedies. D. Howlett plurimis meis verbis salutem nuncies. Proxima septimana Mediam villam Warwicensem revertor. Tu iterim fac ut valeas.

Prid. Kal. ix bris Nottleiæ.

[*This letter needs revision with text.*]

28. MS. *Herb. B.M.* “*Lr. 16.*”

[6 Dec. 1668.]

Joannes Wray D. Martino Lister suo S.D.

[Quod partem . . . communicare non graveris.  
C. pp. 34, 35.]

Memini me non ita pridem vidisse apud D. Dent libellum cujus & titulum & Autoris nomen oblitus sum, memini tantum tractare illum præcipue & tradere ea quæ ad mores, vestitum, ornatum, gestum, in universum decorum in omni vita & conversatione civili observandum (*bien séance* Galli vocant) pertinent; addidit etiam proverbiorum fasciculum, tu si librum investigaveris & quæ in rem meam sint excerpseris rem mihi gratissimam facies.

[Formicarum nulla . . . destillando elicuisse. C. pp. 35–36.]

[ ] in quot angustias & laqueos compulerint homines minime quidem malos, at timidiores, de futuro non securos, & pauperiem veritos: quæ miserorum conscientijs vulnera inflixerit. Dices non ignorare candidatos quâ conditione in collegium sociorum admittendi sunt, quod jusjurandum præstare tenentur,\* verum quidem id est; at sunt plerique omnes qui sodallitia ambiunt (in nonnullis saltem Collegijs) κομιδῇ νέοι temerarii & præcipites, quidvis agere & pati parati, modo parentum & tutorum voluntat[ibus] obsequantur, & votorum suorum compotes fiant. Quidni ego de hisce apud te libe[re] conquerar, cum & ipse ab ejusmodi statutis me male multatum sentiam. D. Howlett plurimam salutem impertias meo nomine. Gratulor vobis quem nacti estis thesaurum; nec invideo alijs bonum, (ut Plinij verbis utar), quo ipse careo, sed è contra potius voluptatem quandam jucunditatemque

\* *debeant* erased. My friend Mr. J. U. Powell, of St. John's College, who kindly made a special journey to London to settle the text of these letters, suggests that when Ray altered the ambiguous word “*debeant*,” he had not observed that he ought to have altered “*jusjurandum præstare*” to “*ad jusjurandum præstandum*.” “*Tenentur*” implies that they are *bound* to do something.



percipio, si quæ mihi denegantur amicis superesse video. D. Willughby te vicissim salutat, & prospere in eodem stadio currenti successus vovet.

[Episcopum Cestrensem\* . . . vix sufficio. C. p. 36.] Quid ergo malum tibi in mentem venerit, inquires, ut tam prolixam epistolam scriberes? Nescio quomodo materia id suasit, nec paucioribus expedire potui quæ tibi communicanda habui. Ignoscas pro hac vice, in posterum cautior ero ne quid hac in parte delinquam. Nec tamen officium scribendi penitus negligam, quoniam amicitiam nostram nullo modo refrigescere vellem, quæ est, ut Aristoteles recte definit, εὐνοια ἐν τοῖς ἀντιπεπονητοῖσι μὴ λανθάνουσα† & proinde fomento ei opus est, nè paulatim extinguatur. Sed manum de tabula, ne non tam epistolam quam libellum scribere videar, vale.

Dabam Mediæ villæ  
viii<sup>vo</sup> Id. Decemb. 1668.

29. MS. *Herb. B.M.* “*Lr. 18.*”

These for Mr. MARTIN LISTER in his chamber at S. Johns College in Cambridge.



[13 Mar. 1668.]

J. Wray D. Martino Lister, S.D.

Post integrum demum mensem libellum accepi, cùm de eo jam plane desperaveram; quod in mora fuit, quò minùs ad te scripserim à tanto tempore, nè me officii neglecti insimules, quamvis non bene sciverim nec adhuc sciam ubi locorum sis, aut quo literæ meæ dirigendæ sunt. Observationes tuas aliquandiu apud me detinui, quoniam innuere videbaris, & cochleas una cum epistolis missas, (quarum cùm in charta cui inclusas speraveram, nec vola (qd aiunt)

\* Bishop Wilkins.

† Εὐνοίαν ἐν ἀντιπεπονητοῖσι φιλίαν εἶναι.—Arist. *Eth. Nic.* viii, 2, 3.

nec vestigium), expectavi tantisper, donec viderem an in eundem cum libello fasciculum compositæ forent. Verùm cum & ea quoque spes me fefellit, non ulterius morandum ratus, Londinum statim observationes misi, nec tamen hactenus scio quid de ijs factum sit; nam amicus ille cui eas consignaveram, (ut postea intellexi) ab urbe antea discesserat quam literæ meæ eò perlatae fuerint; unde periculum est nè cum literis & observationes una amittantur, quarum jactura me imprimis malum haberet, ideóque ijs exquirendis quod in me est sedulo faciam.

[Nos hic nuper . . . fæminas observavimus. C. pp. 38-39.]

Quod novæ tibi molestiæ exortæ sunt, vehementer doleo, opto quoque & tibi prosperos exitus, ut sc. te ipsum omnibus difficultatibus feliciter (favente numine) expedias, valeas, & bene rem geras.

Dabam Mediæ villæ

3 Non : Mart. 1668.

**30.** MS. *Herb. B.M.* “*Lr. 19.*”

[7 May 1669.]

Jo: Wray D. Martino Lister suo S.D.

Quod dignissimo D. Patri tuo in omnibus licitis honestisque rebus obtemperare, ejusque voluntati morem gerere firmiter decreveris, te vehementer laudo, utque in eodem proposito velis constanter perseverare exhortor. Piè enim & prudenter & omninò prout te dignum est facis. Eboracensis tuæ profectionis causas nec ego facilè divinare queo, nec curiosiùs inquirere audeo. Verùm te in reditu (namque iter illud jampridem confectum existimo) hic sollicitè expectavimus ego & D. Willughby qui plurimam tibi salutem impertit: frustra tamen, ut eventus docuit. Non ita multo post Episcopus Cestriensis hâc transiens, nos invisit, & secum una abduxit Cestriam usque, ubi D. Willughby in febrem tertianam incidit, non simplicem & exquisitam,



sed anomalam nec malignitatis suspicione vacuam, quæ sævissimis paroxysmis eum graviter afflixit & debilitavit, adeo ut post duas dierum hebdomadas vix eas vires receperit ut ausus sit se carpento committere & in viam dare; necdum integrè convaluit. Vides me semper excusationem paratam habere quòd ad te seriùs quam par est rescribam. Verùm non omnino infructuosa nobis fuit hæc mora, nam

[dum Cestriæ . . . Sed hæc mitto. *C.* pp. 39–42.]

Communis noster amicus D. Skippon nuper uxorem duxit. Cùm jam omnes familiares & intimi mei te uno excepto uxorati sint, quid mihi agendum restat?

[De Bufonibus . . . agi jussit. *C.* p. 42.]

Ubi sis, quomodo valeas, quid agas, me quamprimum certiore facias rogo, namque & ego hinc brevi discessurus sum & illa vehementer scire desidero. Vale.

Dabam Middletoni

Nonis Maij. 1669.

**31.** MS. *Herb. B.M.* (copy). “*Lr.* 21.”

MIDDLETON, Novemb. 15, 1669.

[Dear Sr, . . . in your own language. *C.* p. 43,]

In the first place I beg your pardon for so long deferring to return answer to your former, which yet I have done some weeks before I received this last: which as yet it seems, I know not through what miscarriage, is not come to your hands. Your friendship and affection as I do deservedly value at a very high rate, so that I should be loath that through any negligence or omission of mine it should cool or decay, and therefore shall be careful always with my best endeavours by all offices and services on my part to cherish and increase it.

[I am extremely . . . private concerment, *C.* pp. 43–46.]

to impart to you or rather request of you which is that you would inform him, whether Mr. Gregory be about purchasing part of Sir Wm. Hickes' his estate lying

thereabout & if so [be that] he be resolved to proceed in it, whether he would be willing to admit him to join with him in the purchase, or let him have that part of the land which lies next him.

[I could wish . . . opportunity. C. p. 46]

I pray tender my very humble service to your Lady, I most heartily wish you both all the joyes and blessings of a married state and whatever may conduce to your mutual content and happiness, & so I take leave and rest,

Sir, Your very affectionate friend and humble servant,  
JOHN WRAY.

**32.** MS. *Herb. B.M.* “*Lr. 22.*”

These for Mr. MARTIN LISTER at Notingham.



MIDDLETON Decemb. 10, 1669.

[Sr, I have perused . . . Jo : WRAY. C. p. 47.]

[P.S.] Forget not my humble service to your Lady to whom I wish, when the time shall come *felix puerperium et masculum prolem*.

**33.** MS. *Herb. B.M.* (copy).

MIDDLETON Feb. 13, 1669.

[Dear Sr, . . . on that subject. C. pp. 52–53.]

I never went further yn Ferrantes Imperatus his naturall history. Aldrovandus his *Museum metallicum*. The musæa of Wormius & Calceolarius, J. Bauhinus *de fonte et balneo Bollensi*, Boetius de Boot *de Gemmis* & Schroders *Pharmacopœia*.

[I have run . . . to be printed. C. p. 53].

I shall add no more at present but my humble service to yourself & Lady assuring you that I am

Sr, Yours entirely in all service,

JOHN WRAY.



Lister addressed the reply to this letter to—

“These for Mr. JOHN WRAY at Middleton Hall, Warwickshire,” signing it MARTIN LISTER, and giving his address as “For me at Carleton Hall in Craven, Yorkshire, to be left at Ferry briggs for Bradford Post.”

### 35. MS. *Herb. B.M.*

These for Mr. MARTIN LISTER at Carlton neare Skipton in Craven Yorkshire.



WOLLARTON April 28, 1670.

[Dear Sr, This next week . . . spring very backward. C. pp. 55–56.]

I hope your Lady (to whom I send my humble service), is safely delivered, and should be glad to receive the good news from you. Mr. Willughby is I fear fallen into a Tertian ague, his Lady waits her every day, and I verily believe at our return to Middleton (which will be the latter end of this week) we shall find her in the straw. I hope you will bestow some time in searching the English Alps about you for what early plants may grow there; though I fear few will be found at this season. I have no more to add but that I am

Yours entirely,

JO: WRAY.

### 36. MS. *Herb. B.M.*

These for Mr. MARTIN LISTER at Carleton hall near Skipton in Craven Yorkshire.



( $\frac{1Y}{5}$ )

WOLLARTON, June 29, 1670.

Sir,

I have now received 2 letters from you for which I am your debtor. This latter by the gardener of

Wollerton not till yesterday, when I came hither with Mr. Willughby. The former, with the table of spiders enclosed, as soon as could be expected after its date, and before the Bishop of Chester's arrival at Middleton. I must acknowledge myself much to blame that I gave you no account of the receipt thereof: for that is I think more ingenuos than to plead excuses, and tell you that I have ever since been very busy or in constant motion, having previously taken a journey into Essex. My catalogue\* is in the press, but not yet finished. About a fortnight ago I received 7 sheets, containing 112 pages, which I guess will make about  $\frac{1}{3}$ d part of the body of the Catalogue so that the whole will be 335 pages besides the Preface, Appendix, and Index, yet I hope it will be not so gross as to be altogether unportable for the pocket. The Letter and paper I like well, and the correcting is tolerable, much better than I expected at London. The place for *Valeriana Græca* I shall according to your desire send up to be added to the former in case it come timely enough, as I believe and hope it will, it being the last Letter. Some things that came to my hands and memory after I had parted with the Copy I have been forced to add by way of Appendix.

[For my own part . . . double that number in England. C. p. 60.]

I hope your Lady is ere this time safely delivered and that I ought rather to congratulate than wish her a happy hour.

[In your table of spiders . . . JOHN WRAY.  
C. p. 60.]

### 37. MS. *Herb. B.M.*

MIDDLETON, July 17, 1670.

[Dear friend,

In my last . . . which I hope may be of good use. C. pp. 61–62.]

Your table of spiders I shall send back shortly. Looking

\* Ray *Catalogus Plantarum Angliæ*, 1670.



upon the address you sent me, I do now perceive that I mistook in the direction of my last, and therefore have some reason to fear that it might miscarry, which makes me the more hasty in sending this after it.

[This summer . . . professed to me. C. pp. 62–63.]  
I shall add no more but my humble service to your Lady (who I hope ere this time is safely at least delivered if not up again and *pulchra fecit te prole parentem*) and that I am,

Sr, Yours most entirely in what capacity you  
please as friend & servant,

JOHN WRAY.

38. MS. *Herb. B.M.* (copy).

These for Mr. MARTIN LISTER at Nottingham or elsewhere.  
For Dr. LISTER without Michaels gate Barr in York.

[August 22, 1670.]

D. Martino Lister Jo. Raius, S.D.

AMICE CHARISSIME,—

[Catalogum meum . . . ocyus rescribas. C.  
pp. 64–65.]

Ut valeat conjux tua [di]lectissima et infans nuper natus semper cupio. Haec jam tertia epistola est quam ad te scripsi ex quo aliquid a te literarum acipi; ne ergo differas responsum sed me de tui ipsius tuorumque omnium valetudine quam primum certiolem [facias]. Vale.

Mediæ Villæ xi Kal. Septemb. 1670.

41. MS. *Herb. B.M.*

MIDDLETON March 3, 1670.

Dear Sr,

Since the receipt of your last I have for some time been absent from this place about an important affair. Sir Wm. Willughby of Nottinghamshire dying about the 12 or 13th of the last month, did by will devise to Mr. Willughby (whom he called cousin though I think

they were nothing akin) a very considerable estate viz. South-Muskham and Carleton in Nottinghamshire and some lands in Yorkshire, amounting in the whole to little less than 1000*li* per annum in good rents, besides the reversion of about 250*li* per annum given to servants in annuities for their lives. But Mr. Dixy, son to Sr. Wolstan Dixy of Market Bosworth in Leicestershire, who married the sister and heir at law of Sir W. W. will endeavour to render the will invalid, by proving Sir W. W. to be *non compos mentis* at the time of the making thereof, which I believe he will never be able to do, for that it may be proved by sufficient testimony and witness that it was Sir William's design and intention for a great while before to dispose his estate as he has done, and that he was of sound mind and memory at the making of the will; yet he may give Mr. Willughby some trouble, he having gained all the servants to his party, excepting the steward, solicitor and one more (who were witnesses to the will) and also two of those who were witnesses to the will, who I believe will swear stoutly that he was not *compos mentis*. The said Dixy has hindered the executors from making any inventory of the goods and chattels, and has I believe by this time seized into his hands all the writings and treasure of money that was in the house, which was judged to be by them that said least, 6000*li* or 7000*li*. The keys were delivered to the executors, but so soon as Sir William was dead Mr. Dixy hangs padlocks on the doors and seals up the locks, and has by force turned out the guard which the executors set to keep watch at the doors, and lately also excluded the 3 servants whom I mentioned before to be witnesses to the will. That which gave him this advantage was, that this house wherein Sir Wm. lived was entailed upon his wife, and so her freehold so soon as the breath was out of her brother's body: and they were gotten in there before he was dead. About this buisness Mr. Willughby being sent for, desired me to accompany him into Nottinghamshire, which I did, and there we have spent



a considerable time in conference with the executors, making enquiries into the state of things, getting what intelligence we could and consulting counsel how he ought to proceed. We went over to Sefton the place where Sir Wm. lived, intending to have had conference with Mr. Dixy, but he was then out of the way : I hear he is of a contentious spirit, and will not easily be brought to reason. My attendance upon this affair I hope will plead my excuse for having thus long deferred my answer. This journey has interrupted my observations about the bleeding of trees.

[I have not yet had the fortune . . . to be communicated to the Royal Society. *C.* pp. 80–82.]

I am glad you are now got into a way of correspondence with him.\* But it is time I make an end. Mr. Willughby is very well and much your servant. Farewell.

Yours most affectionately in what capacity you please,  
JOHN RAY.

#### 42. MS. *Herb. B.M.*

These for Mr. MARTIN LISTER at his house without Michael-gate barre in Yorke.

( $\frac{AP}{19}$ )



MIDDLETON, April 13, 1671.

Most dear friend,

[Since the receipt . . . I have as yet heard nothing of from Mr. Oldenburg. *C.* pp. 83–85.]

Mr. Willughby is much your servant, but at present so oppressed with businesse that he can find little time to prosecute Philosophicall studies. The estate bequeathed him, will create him a great deal of trouble, and cost much money, and yet what the issue may be is uncertain, by reason of an errour in the will. I have done.

\* Oldenburg.

I pray render my service to your Lady, and esteem me to be as really I am,

Sr, Your very affectionate friend and servant,

JO : RAY.

43. M.S. *Herb. B.M.*

MIDDLETON, June 28, 1671.

Dear and honoured friend,

At my return hither, which was the 24 instant, I found a letter from you dated the 18th, which brought me the unwellcome news of your illness and indisposition. I pray have an especial care of yourself, for those diseases which affect the brain and *nervosum genus* are very dangerous, and of most difficult cure, as you know well enough.

[For my part . . . finding these things. C. p. 86.]

The last week I was at Cambridge, where I visited Mr. Howlett and supped with him in company with Dr. Brackenbury and another of the fellows: we remembered you and drank your health.

[I intend . . . communicate to you. C. p. 87.]

Remaining [     ]

[*The remainder of this letter has been cut away.*]

47. MS. *Herb. B.M.*

These for Mr. MARTIN LISTER at his house in ye city of York.



( $\frac{M}{6}$ )

MIDDLETON, March 2nd, 1671.

Dear Sr,

Since my return hither I received both your Letters, and withal a great satisfaction to understand that you are in so tolerable a state of health; and that you are still mindful of and retain the like kindness and affection to me as formerly. I find that I was mistaken in my last Letter. I had thought then Mr. Willughby had intended to have gone to York himself to deliver back



the will to the Spiritual Court but he tells me that he went not, but trusted his man with it. Mr. Dixy intends, (at least pretends) to have another trial next term in the Court of Common pleas : and if so the will must again be gotten out of the Spiritual Court ; for after a whole year and more they have not yet proceeded to sentence there.

[I thank you . . . what you assert. C. pp. 94-95.]

Next week I am thinking to leave this place for a while and take a journey into Essex ; where, when arrived, you shall hear further from me ; in the mean time I rest

Sr, Your most affectionate friend and humble servant,  
JO : RAY.

*Derham's MS. abstracts.*

47 D. May 18, 1672. Wil[lughby] and Dixy. Going to ye W. of England, which will dispatch his search of Engld. Preparing his Topograph. etc. observ[at]ions].

47 E. June 17, 72. Mr. Wil[lughby] dang[erously] ill and better which put off his simpling voyage. *Topogr. Observ.*

47 F. July 3, 72. Mr. Will. died this morn.

47 G. July 31, 72. Trustee to Mr. W: and Exec[uto]r.

47 H. May 30, 73. Congratulating his design of print[ing]. Had cast his eyes on one of 20 y[ears] intend[ing] to marry her. Is with Mr. Will[ughby's] *Ornithologia* and an heavy w[or]k.

Lister's reply was endorsed with the following notes written by Ray :

- “ 1. My mother yet living. [She died in 1678.]
2. Inconvenient for me to die heer for want of attendance.
3. Journey between this & Essex long for a man of my age to ride alone.
4. You brought up in a different way and not likely to love my prayers.
5. The children will never delight in my company for that I shall be old before they come to years of discretion.
6. I shall have nobody heer to converse with.”

49. MS. *Herb. B.M.*

These for Mr. MARTIN LISTER at his house in the City of York.



( $\frac{DE}{3}$ )

MIDDLETON, November 29, [16]73.

Dear Sr,

[I received yr last . . . in that respect ashamed of it. *C.* pp. 104–105.]

As for the other businesse; I have sent to London for the best [ ] can be procured, because I would leave nothing unattempted that might probably doe good. I had before used some made in the country, and indeed I cannot say altogether without effect. I wish you would send me your judgement of those receipts in Prevotius his *Materia Medica*,\* which to me seem to be very good. From [ † ] calcined I expect not much, as supposing the virtue of them will be quite taken away by that means, there remaining little also in the ashes but the fixt salt.

[I am going on . . . figures engraved. *C.* p. 105.] In my next I shall write more largely about this matter,‡ desiring your advice and assistance, I must now make an end lest the Post be gone. Many thanks to you for your real expressions of kindnesse, with hearty prayers for yourself and dear relations. I rest,

Sr, Yours entirely,

JOHN RAY.

*Derham's MS. abstracts.*

50 I. Jan. 17, 1673–4. Mundeck. Wish success in ex[cursion]  
 . . . on Minerals.

50 J. Feb. 3. Fishes described. *Qu.* of Halibut etc.

\* Jean Prevost was the author of *De remediorum*, 1611, and of numerous posthumous works printed after his decease in 1634.

† Word erased.

‡ Willughby's *Ornithology*.



51. MS. *Herb. B.M.*

These for Mr. MARTIN LISTER at his house in the City of York.



(SE)  
(14)

MIDDLETON, Sept. 12, 1674.

Dear Sir,

At my return hither out of Essex (where I have been for about a moneth) I found a Letter from you, to which had it been received in time you had not so long wanted an answer. I have according to your desire written both into Sussex and Cornwall for tin and iron-ore; and I have advice, that out of Sussex there is a bag of the latter already come up to London and delivered in to Mr. Lodge, according to your direction; Out of Cornwall I cannot yet expect an account, but am confident, that if my Letter miscarry not, my friend there will procure for me and send up to London as many of the particulars desired as can easily thereabout be had. But we must have a little patience with him, the tin mines being at some distance from his habitation; and when he shall have furnished himself, possibly there may not be a vessel ready instantly to set sail for London. Though I think it be hardly worth the while yet because you desire it, I shall the next opportunity send away Sgr. Boccone's Epistle to Nottingham to be thence conveyed to you at York.

[In the last . . . given you encouragement to persist. C. p. 107.]

I shall add no more at present but that I highly prize and acquiesce in your friendship, and looking upon your kind expressions as the issues and effects of a real and hearty affection, I cannot but gratefully resent them, embrace your good will and reciprocally love and honour you; and so take leave,

Sir, your very affectionate friend and most  
devoted in all service,

JO. RAY.

Pardon my scribbling and the mistakes and incongruities committed through hast.

54. MS. *Herb. B.M.* (copy by J. D. Enys).

MIDDLETON, Dec. 19, [16]74.

Dear Sir,

I have now so long deferred writing to you that you may justly esteem me negligent of what concerns me as a friend, I mean corresponding with you by Letter. I am sensible that I am in your debt, and have only to plead for my excuse, that I waited for an answer from my correspondent in Cornwall, that so I might give you an account of that affair. But none coming after two Letters sent, I do now almost despair of procuring you what you desire from thence, for either my Letters must miscarry, and then I have little hope of directing them so but they will always miscarry, or else my friend is dead ; or unwilling to gratify me as he promised when I saw him here the last summer. However, I will venture another letter to him, in which I shall enclose your note of the particulars you desire.

I am glad you have received Boccone's epistles.

[I thank you for the information . . . not time to add more, than that I am, . . . C. pp. 112-113.]

In this letter Ray refers to Dr. Towne, a correspondent of Lister, one of whose letters dated Barbadoes, March 26, 1675, helps to elucidate the references on pp. 111 and 112 of the *Correspondence*.

Dr. Thomas Towne writes to Lister : “. . . When you are pleased to write to me again (which I hope will be often) I desire you would send your letters to Mr. Samuel Penn merchant in London, which is commonly sufficient directions to one known upon ye exchange, however I'll get him to give you more particular directions. If you acquaint him with any newe books etc. : especially your own about spiders and Mr. Ray's Ornithologie, he wil procure and send ym to me. . . .”—(MS. *Lister* 35, letter no. xiv.)



*Derham's MS. abstract.*

54 K. May 7, 1675. Has translated ye *Ornith[ologia]* into English. 20 sheets of ye Latin printed. Rudd. . . .

56. MS. *Herb. B.M.*

These for his honoured friend Mr. MARTIN LISTER at his house in ye City of York. Pd to London 3d.



(AP)

SUTTON COFIELD, Aprill 4, [16]76.

Dear Friend,

[I rec<sup>d</sup> yrs of Feb. 8 . . . which I had not thought fit to cumber the book with. C. pp. 121–113.]

Now Sr to answer your kind enquiry concerning my health, I have (I thank God) pretty well escaped this epidemical distemper: but I have had a long continuing cold, never so violent as to take me quite off my business, which I am not yet clear of, it returning and renewing continually when I think it is going. I am glad of and give thanks to God for your deliverance from so great a danger, and pray for the continuance of your health, resting,

Sr, your very affectionate and faithful  
friend and servant,

JOHN RAY.

58. MS. *Herb. B.M.*

These for his honoured friend Mr. MARTIN LISTER at his house in ye City of York. Pd to London 3d.

[This letter, dated from Sutton Cofield, June 14, 1676, has been printed in full in Ray's *Correspondence*, pp. 123–124.]

59. MS. *Herb. B.M.*

For his honoured friend Mr. MARTIN LISTER at his house in the City of York.

(1Y)  
(17)

SUTTON COFIELD, July 15, [16]76.

Dear Sr,

[Yours of July 2<sup>d</sup> . . . searching and enquiring into those things. *C.* pp. 125–126.]

I am this summer to take a journey into my own Country Essex, I doubt I shall scarce get time and liberty to give you a meeting but of this you shall hear further from me. I rest

Sr, Your affectionate friend and humble servant,

JOHN RAY.

*Derham's MS. abstracts.*

- 59 L. Nov. 28, 76. How to write to Mr. Jessop. Horse fell & he lame. Catal[ogue] slowly. Nothing done towards print[ing] *Hist. Fishes*.
- 59 M. Jan. 24, 76. Mr. Child will treat with bookseller about printing *Hist. Fishes*. He sordidly covet[ous]. She removed from Mid[leton] to Wansted. Wil[lughby] removed from him, who staid there for their sakes, theref[ore] he will go into Essex next year.
- 59 N. July 11, 77. Sutton Cofield. Will soon remove into Essex. Will visit him and Mr. Jessop.
- 59 O. Nov. 12, 77. Falbourn. He is near Witham at a Gent[leman's] that lent his house, but wishes a less house. Mr. Jessop. *Collect[ion] of Proverbs*, a 2nd edition. Mr. Child will scarce let his wife part with money to engrave *Hist. of Fishes* . English *Ornithology* abroad.

At this point the correspondence between Ray and Lister seems to have come to an abrupt conclusion and its place was taken in Ray's life by an even more regular correspondence with Dr. Tancred Robinson, who used to send on the news to Lister, as in his letter dated London, Mar. 15, 1682–3. "Your freind Mr. Ray is about writing a Generall Herball, which must needs



be very accurate: Anatomy goes on apace here . . .” (MS. *Lister* 35, no. 29). But that Ray continued to write to Lister is proved by a single letter of 1689.

**86.** MS. *Stowe* 746, f. 113.

For Dr. MARTIN LISTER at his house in the Palace yard near Westminster Hall. Westminster.

BLACK NOTLEY, Aug. 5, [16]89.

Dear Sr,

About a week since I recd. the parcell of dried plants you sent, recommended to your care by Mr. Lloyd, with two letters enclosed, one from him to yourself to me, which though short was very welcome, as coming from a person whose friendship I so highly value, and therefore cannot but kindly resent any expression and effect of it. I am at present (I thank God) in health, but begin to feel the impressions of old age. God grant you good successe in your practise and enquiries for the public benefit, with health and long life. So I rest

Sr, Your affectionate friend & humble servant,

JO : RAY.

There is also the cover of a letter addressed in Ray's handwriting among the autographs in the Department of Botany in the British Museum, but unfortunately it has become separated from its contents, and the dated post mark is indistinct.

These for Mr. MARTIN LISTER at Burwell near Louth in Lincolnshire.

Leave this with ye Postmaster at Grantham to be sent as above directed.

By analogy with the address used in 1667 by Lister and quoted on p. 111, this cover would appear to have come from one of Ray's earlier letters.

## VI.

LETTERS OF RAY TO TANCRED ROBINSON,  
1683 TO 1694.

Dr. Tancred Robinson succeeded William Musgrave in the Secretaryship of the Royal Society in 1685, so that Ray's letters to him are evidently of a semi-official nature. Robinson conducted an active correspondence with many people, thus following Oldenburg's example in the previous decade in collecting information and in transmitting it to his scientific friends. When Robinson went out of office Ray wrote to his successors—Gale, Waller and Sloane.

65. MS. *Herb. B.M.*

BLACK NOTLEY, July 27, [16]83.

Sr,

[I render you . . . eminency since that time.  
*C.* pp. 134–135.]

Monsr. Fagon a very ingenious person and skillful herbarist, and who had the greatest hand in the editing of the Catalogue of the Physic Garden then put forth, was employed (as I remember) in the Laboratory and Apothecary shop belonging to the Physic garden. Monsr. Marchand I hear is dead; and Dr. Magnol has since published a Catalogue of the plants growing wild about Montpellier, which I want and know not how to procure here.

[As to the *Bistorta* . . . omitting the epithet *Canadensis*. *C.* p. 135.]



You would do well to preserve dried fair patterns of that and other plants not yet figured, that so if occasion requires, cuts may be taken from them. I find great confusion among Herbarists concerning the *Sideritides* and I would gladly be resolved whether the *Sideritis hirsuta erecta*, and *Sideritis hirsuta procumbens* of C. Bauhinus be really distinct or but one and the same species. The *Sideritis arvensis latifolia glabra* C.B., if it be the plant I understand and have found wild both in England and beyond the seas, is falsely so-called, because it has always a rough or hairy leaf, though I confess it as well deserves that Epithet as *Ladanum segetum*. I am not satisfied, what you mean by the name of *Turritis minor*, whether *Barbarea muralis* J.B. (which was formerly by the London herbarists so stiled, and by others *Cardamine pumila Bellidis folio*) or the *Brassica sylvestris alpina* B. pin. which if distinct from this is to me unknown. This *Barbarea muralis* might very well be called *Turritis minor*, both because the stalk below and lower leaves are rough, the upper smooth, as in that; and the cods in like manner erect; the flower alike white. I should be very glad to hear further of your progress and what discoveries you make in natural history, especially that of plants, for I am now, by the instigation of some friends, about compiling a general history of Plants, wherein a person of your skill and insight may afford me great assistance, by the advantage of your travelling into those parts where those plants are said to grow that I doubt of. I shall be bold to trouble you with my doubts and queries hereafter; at present I shall add no more but that I am

Sir, Your very humble servant,

JOHN RAY.

67. MS. *Herb. B.M.* (copy by J. D. Enys).

Ray's rough draft for this letter is on the back of Robinson's letter dated from Leyden, June 4.

BLACK NOTLEY, June 16, [16]84.

Sir,

Since you began your travels beyond the sea this from Leyden is the 4th Letter I have received of them you did me the favour to write and send. That you mention from Rome unhappily miscarrying and not coming to my hands, for which I am very sorry. I thank you for your ingenious and instructive communications therein, and assure you that I treasure up your letters by me as choice cimelia, which I highly prize.

[Most of our herbarists . . . an opportunity to remark. *C.* pp. 143–145.]

With my best wishes for your prosperous success in your succeeding journey and safe return into your native country where I should be very glad to see you. I conclude and rest

[JOHN RAY].

*Postscript.*—Dr. Lister (for I perceive by the title-page of his book he has taken that degree) I have not lately held correspondence with by letter. I understand by Mr. Faithorne (by whose hands he sent me a copy of his last book) that he has removed his habitation, to whom I refer you for a further Acct. of him.

68. MS. *Herb. B.M.* (partly in *Phil. Trans.* xv, p. 1041).

For my honoured friend Mr. ROBINSON.

BLACK NOTLEY, Aug. 13, [16]84.

Sr,

[I received ye box with the skins of the male and female Macreuse . . . fancied to myself. *C.* p. 148.]

The first knowledge of this bird was had from Mr. Jessop, who sent us the skins of this among other birds stuffed from Sheffield in Yorkshire, by the name of Scoter, as it seems they call it thereabouts, whether from the dark or black colour of it, or (which is more likely) from Scotland, whence they might suppose it to come. Afterwards the cock of this kind was found in



the market at Chester by the then Bp. Dr. Wilkins his steward, who bought it and brought it home to the palace, where I then happened to be, and saw and described it. Last of all Sir Tho. Brown of Norwich sent among many others the picture of this Duck : and Mr. Johnson of Brignall near Greta Bridge in Yorkshire the description, as I have related in the book and page fore-quoted. I need not tell you how I distinguish the sea-ducks from the shallow or plash Ducks, because I have done it already in the place mentioned.

[Mr. Graindorge's description . . . said it was the former way. C. pp. 148-151.]

The prosecution of this *History of plants* does so wholly employ and take up my time, that I can hardly find any to write to my friends : and I have also lately been a little disturbed and interrupted by the indisposition of my wife, who was yesterday delivered of two children at a birth, both females. I have nothing to communicate to the Academy you mention upon any subject, but is obvious to every man's thoughts that considers it. I may in some things propose queries and scruples to them, if they have not enough of those already before them. To the perfecting of the *History of Plants* I think it were convenient to insert those of the *Hortus Malabaricus* that are not already elsewhere described ; and Mr. Bannister\* (who I hear is now in Virginia) might make a great addition to it by communicating the non-descript species of that country. As for the faculties and uses I must entreat the contributions and corrections of yourself and other learned and observant physicians. Now that I have filled my paper it is time to have done. I shall therefore only add that I am

Sir, Your affectionate friend and humble servant,  
JOHN RAY.

\* The Rev. J. Banister made a collection of plants from the Physic Garden at Oxford which is now in the Sloane Herbarium. In 1680 he sent Ray a list of plants indigenous in Virginia, whither he had gone as a missionary. He died between 1692 and 1696 by a fall from rocks. *Banisteria* commemorates his name.

69. MS. *Herb. B.M.* (copy by J. D. Enys).

For his hon<sup>d</sup> friend Dr. TANCRED ROBINSON to be left with Mr. Henry Faithorne, Bookseller at the Rose in Pauls Churchyard, London.

BLACK NOTLEY, Oct. 22 [16]84.

Sr,

[Much controversy . . . Dr. Morison is a Scotchman. . . . C. pp. 151-6].

Your affectionate friend and humble servant,  
J. RAY.

71. MS. *Herb. B.M.* (copy).

March 13 [16]84.

[Sr,—Yours of the 10th . . . you may command. C. pp. 163-4. *Phil. Trans.*, see p. 90.]

The fittest persons to undertake the printing of this work were those who bought Mr. Martin's stock & so have the copy of the Ornithology. But I did before despair of any Booksellers meddling with it unlesse encouraged by subscriptions. Please to tender my humble thanks to ye Royall Society for their forwardnesse to promote the publishing this work, which I hope may not be altogether unpleasant or unusefull to inquisitive and ingenious persons. I return you many thanks for ye multiplied kindnesses and rest Sr,

Your very affectionate friend and humble S<sup>vt</sup>,

JOHN RAY.

72. MS. *Herb. B.M.*

For his honoured friend Dr. TANCRED ROBINSON. To be left with Mr. Henry Faithorne Bookseller at ye Rose in S. Pauls Churchyard London.

( $\frac{AP}{2}$ )

B[LACK] N[OTLEY], April 1, [16]85.

Sir,

I wrote to you by the last post, and yet I cannot let you rest. Searching Dr. Plott's history and considering his descriptions of the fishes named, I begin to be in doubt whether they be already described or no.



The first is a sort of *Lampetra* with roded or straked sides, which whether described and entered in our History I cannot certainly say. You may easily by comparing the descriptions of those we have entered (which are not many) resolve that. There are also in Baltner some fishes of that kind figured and described, which we have not admitted. The *Lampetra flava* I take to [be] an accidental variety, and the *Lamp. bicauda* a monstrous production, not a constant species; but there are one or two more, which possibly may be new species. Not understanding High Dutch I was at a losse and uncertain concerning some species there figured. For though it is not to be supposed that a man of his education should be able to describe Animals well, yet so much might be gathered from the notes he gives as might lead an understanding and attentive man into the knowledge of them, and with the figure, (which is in all very exact) give him so much light as to enable him to determine the species. There is next to these an Anguilliform fish I am in doubt of.

As for the Finscale of Dr. Plott, if it hath indeed, as he says, teeth in mouth or lips it is a strange and unheard of fish, doubtless not yet described nor mentioned by any author. But I suspect the Dr. was therein mistaken, and that it is a leather mouthed fish, and carries its teeth as the Roach, and all other of that tribe does in the bottom of its mouth, or in its throat, or in the mouth of its stomach, which you please. I remember the draught of a fish in Baltner which as I take it he calls Rotele, which for all the name is not the Rutilus or Roche. I know not what to make of it, nor could I find it in other books, and therefore put no name to it, nor yet entered it in the history. Dr. Plott's description answers so well to this figure, that I am persuaded the Finscale and Rotele of Baltner are the same fish, (if I remember aright and that broad fish with the very red fins in Baltner be termed Rotele) and that it is a new and by me unseen and undescribed kind. But you that have the picture and the descriptions both of Baltner

and Dr. Plott to compare with it, will be able to make a better judgement. I have neither descriptions of fishes, nor any book to help me but one that as I told you is worse than none, more apt to confound than resolve. I believe it is not the *Ballerus* of Rondeletius.

[A friend & neighbour . . . a further account of it. *C.* p. 165.] Printed on p. 91.

Just now I received a Letter from Mr. Cole giving an Account of some observations of his concerning shell-like stones and likewise of the *Purpura* he found in the Severn near Minehead, which expecting the return of the Post I cannot now transcribe.

Looking over your Observations I send out of the German *Ephemerides* this note. “Fungorum plurimi è terra erumpentes semen habent si curiose examinentur formâ quamvis minori Alevae Ægyptiacæ semon fere experimento.” I have not that volume of the *Ephemer.* & therefore desire you would send me all you there find or otherwise know of it. Pardon my scribbling, & impute it to the haste of Sr,

Your affectionate friend and humble servant,

JO. RAY.

### 73. MS. *Herb. B.M.*

For Dr. ROBINSON.

BLACK NOTLEY, April 29, [16]85.

Sr,

[Dr. Lister's opinion . . . high and low Germany were unfortunately lost. *C.* pp. 165–166.]

Be pleased therefore to make the *Rotele* a species by itself by the name of *Rutilus latior*, or *Rubellio fluviatilis*, and add for synonyms *Rudde* and *Finscale*.\* For a description I perceive ours of the *Orfus* may serve indifferently well. If Dr. Lister can acquaint with anything more of the History of it, or anything worthy the notice-taking occurred in *Baltner*, that may be added. And for the *Orfus* let him stand by himself,

\* *Scardinius erythrophthalmus*.



and for a description whereof use Gesner's unless you know where to find a better, and for a supply of the History add what Baltner may afford.

The *Cicirellus Messansis* if it has no fin either on the ridge of the back or carine of the belly, as the words *sans nageoires* may import, it is such a singular fish as has not his fellow in nature that I know of. I never saw, read nor heard of any fish wholly destitute of fins on those parts : and therefore I am very suspicious there may be a mistake in the case.

I received the book of designs you sent, but therein I find no figures which in my judgement may be of use to us. For of all such as are not doubtful and uncertain we have better cuts or draughts ; only the little fish that lies loose I suspect may be the Five-finger fish of Nieuhoffs.

[Your chapter . . . fully agree with you. C. p. 166.]

I render you most hearty thanks for your great kindness many ways expressed, and rest Sir,

Your most affectionate friend and humble servant,  
JOHN RAY.

I understand by Mr. Faithorne, who was here yesterday, that you have some acquaintance with Dr. Covell ; now he might contribute somewhat to our *History*, he having described and drawn himself many plants observed by him in Thrace, Greece and Asia the less. I have employed Mr. Dent to intercede with him : from whom I formerly had a transcript of a Letter of his from Constantinople, containing some descriptions and more names of plants with references to his own draughts and descriptions. I was informed by Mr. Dent, that he was to come over with the Princess of Orange, and that he (Mr. Dent) intended to wait upon him at London, and that he would make me a visit in his return home and give me an account of what he had effected but as yet I have heard nothing of him.

74. MS. *Herb. B.M.* (A copy. The original letter is stated to be in possession of Canon Moor, St. Clements, Truro.)

Mr. RAY to Dr. ROBINSON.

BLACK NOTLEY, May 12, [16]85.

[Sr,—Yours of May 9 . . . But enough of this. C. pp. 168–170.]

I heartily thank you for the pains you have taken and do continue to take in my concerns: and cannot but highly approve of what you have done. Baltner's descriptions are what I expected from him; they will be of little use to us. I agree with you that it is best to put the E. Indian Fishes at the end of the *History* by way of Appendix; they are so lamely and imperfectly described and figured. Upon inspection of Dr. Lister's figure of the Rudde I am of your opinion that it is the Rotele of Baltner, and not the Nerfling, of which last I perceive he gives no description, and his figure also I suspect. Ours of the red Orphus taken at Augsburgh from the life is much better.

Dried plants unless excellently well conserved I dare not rely upon. I know how apt I have been to be cozened and deceived by them: I have not known patterns of some plants dried, which growing I know as well as any. I have from Mr. Dent direction how to address a letter to Dr. Covell, which I intend to do.

I am so teased about cuts for my *History of Plants* all my friends condemning wooden, and telling me I had better print it without any; that I am almost unsettled again in my resolutions, and if your judgement concur, I will print it without any indeed. And if the world thinks it deserves it, cuts may be added afterwards. The Book will come out much sooner. I know not but so, it may be finished in less than a years time. Your further observations will be welcome.

As for the letter for the *History of Fishes* I doubt not but what you approve of will please me, and therefore needless to send any proofs of them.



You forgot to give me anything from Mr. Dodsworth of the History of the Ferns.

I have now sent back the books you did me the kindness to procure for me, and with them my thanks, which is all that I can think of necessary to trouble with at present, resting

Sir, Your affectionate friend and humble servant,  
JOHN RAY.

75. MS. *Herb. B.M.*

For Dr. ROBINSON.

Sr, BLACK NOTLEY, May 22, [16]85.

[Last post . . . the generality of travellers. C. pp. 171–172.]

The Germane *Ephemerides* Ann. 4 and 5. I have, and have taken notice of the Fungi you mention.

I shall return the figure of the Rudde by the next week's carrier, as also Mr. Dodsworth's Ferns: though one of them is so shattered, that its scarce worth the preserving.

The figure of number 32 of Baltner I do not remember; and in his description he gives but a slender account of that fish called orbe, so that I cannot pass any judgement upon it, but must refer it wholly to you. I am,

Sir, Your affectionate friend and humble servant,  
JOHN RAY.

This letter should have been sent last Post: but the boy having no Letters for me did not call. Mr. Faithorne writes me, that you advised to add to the Brief Account I sent him of the H. P. these words, *as also a particular description of their Parts, as Roots, leaf, flower, seed etc. taken from the life*; which I cannot allow, it being not true, the far greater number of descriptions being transcribed out of books, and in the rest there being no more particular descriptions of parts than are to be found in many histories in Books. I did not intend the work should have been printed by subscription. I do not love to draw in men to subscribe as I like

*gibbosus Balthicus*. I remember I saw the skin of this fish at Cologne hanging up in an Apothecary's shop, having a high bunch on the back. I desire your opinion of this fish, for I believe it is not entered in your history.

[Take a pilchard . . . This was tried lately. *C.* p. 174.]

I think you ought to have given us a general characteristic table of plants, viz. herbs, shrubs, and trees, comprehending a general scheme of the whole work, immediately after your general part, before you entered upon particulars, as the submarine plants: if you think this proper it may be done still in a single sheet with a reference to the page where it ought to be inserted.

Dr. Sloane tells me that he wrote to you by the last post. My Bontius and Piso are employed at present about your fishes, or else they should be at your service, I have spoken to Mr. Faithorne to borrow them for you, if he cannot procure them (for men are generally morose, and ill-natured here) I will contrive that mine shall be sent you.

The sculps of your fishes are now much better done than at first, for I complained early. Three parts of them will be better than those of Salvian.

Il sort de la Tige de cette plante (*Panax semine hirsuto foliis pastinacae latifolia, sativae*) après que l'on a reconnu par experience très souverain pour les blessures et quasi toute sorte de plagues, en l'appliquant en forme d'emplastre sur la partie malade. La gomme qui sort de cette plante doit passer pour l'opoponax des Anciens, à cause que la plante dont elle sort est sans contestation une espece de *Panax*, et de toutes les espece de *Panax* connus en Europe jusqu'icy, il n'y en a point que donne de semblable sorte de Gomme. Ex observa. P. Boccone in the *Journal des Scavans* An. 1676 mense Janvar. He goes further, and affirms this *Panax Siculum semine hirsuto* to be the same with the *Panax Syriacum*, from which the opoponax comes, because they both put forth at first three leaves, which divide themselves afterwards into five.



In the *Republique des Lettres* printed monthly at Amsterdam there is a short Botanic discourse wherein the *Persea* of Clusius chap. iv. lib. 1. *rarior plant.* is made the same plant with the *Laurus Indica* of Fol. Aldinus; which takes and grows very well in the Gardens of Holland, though very slowly. Aldinus says it would not flourish in Italy, perhaps he was impatient, and described it when very young. A Dutch Botanist would needs have this *Persea* Clus. or *Laurus Indica* F. Aldin. to be the Cinnamon, or *Cassia lignea*, but he is confuted there. I suppose the *Hortus Malabaricus* (which I have not by me) gives the varieties of the trees, that yields the Cinnamon, and the *Cassia lignea*; some take them for the bark, and wood of the same tree.

[Mr. Dodard affirms . . . of these matters. C. pp. 174–176.]

*Price List of Groceries on the back of the Letter.*

Sugar loaf—4 lb	.	.	.	.	2	4
Sug. 3 lb	.	.	.	.	1	0
Currans 4 lb	.	.	.	.	0	10
Candles 1 lb	.	.	.	.	0	5½
All spice	.	.	.	.	0	2
Oatmeal ⅛	.	.	.	.	0	2¼
Brandy	.	.	.	.	0	6
Tobacco ¼	.	.	.	.	0	2

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5    7½    (*sic*)

77. MS. *Herb. B.M.*

For his honoured friend Dr. TANCRED ROBINSON, etc.



( $\frac{SE}{15}$ )

BLACK NOTLEY, Sept. 14 [16]85.

Sir,

I received yours of 7th or 8th, in answer whereto I could write much: but truly I am straitened for time, being desirous to dispatch with Bontius and Piso, that I may return the book to you again, if it may be, by

this week's carrier. Gesner I have not by me, and though I have some remembrance of the *Orbis gibbosus* yet not so much as to enable me to determine to what tribe it belongs. I pray use your own judgement and if it agrees with the Lump in the characteristic note of having the belly fins united into one, let it be subjoined to it. Possibly I might suspect it for a mistake or a fiction, or a monster, (but that it is a real fish you have satisfied me) but I rather think that through forgetfulness or oversight it was omitted.

What P. Boccone saith concerning the *Panax semine hirsuto* etc. is no more than Dodonaeus observed and wrote of it long ago: and therefore it needed not have been entered in the *Journal des Scavans* as a thing of new observation. I thank you for the note of the *Republ. des Lettres* concerning the identity of the *Persea Clus.* and *Laurus Indica* Aldini.

I sent you now by Mr. Faithorn that I intended a general Table of Herbs. But there is no haste of that. I received this week a parcel of dried plants from Dr. Sloane, which I shall be careful to remit so soon as I have described them.

[M. Dodard's vegetable . . . is not improbable. *C.* pp. 176-177.]

I am very glad that through your care the figures are like to be so beautiful: I doubt not but they will much advantage the sale of the book.

Your chapter *de chymica plantarum Analysisi* as now altered and enlarged, I very much approve of. And because I can find no fault with the matter, give me leave to carp at the orthography and grammar, though possibly you may find as many oversights in any thing of mine, I myself find many after a 2nd, third or fourth reading. In the 5th line of the chapter instead of "dividantur" I think it would have been better "dividuntur" or "dividi possunt." The like I say of "sortiatur" in line 8, and of "transmutentur" in line 12. In line 10 is a literal mistake of "foetidus" instead of "foetidus." In line 9 I should rather



approve of “destillata” than “distillata” and so elsewhere. In page 56, line 18 is a literal omission, I suppose of the Printer, in “hypocondriacos” instead of “hypochondriacos.” Line 23, I cannot so well approve of “reddante” instead of “reddi possunt” or “reddunte”: the like be said of “eliciantur” in line 26. In line 32 is a literal error of “Absynthio” instead of “Absinthio.” Line 40, “juvent” for “juvant.” 48 for “habeant” I should rather approve “habent.” Line 63 you seem to put “utantur” in a passive sense for “usurpente.” In the 57 page are also many verbs put in the imperative of potential moods, which do not so well please my fancy. But of all that I have noted there are no errata, setting aside the Typographical, but may be defended: and there is hardly a page of my doing but has more and worse errata in it which I am a little troubled at: for many times the sense is perverted by them, so that I see it will be necessary to have a long errata.

Looking over Bontius I make no account of his fishes. He has heathenish figures, and no descriptions that are worth anything. We may by the names common to other Authors gather what fishes he means. His *Pisciculus cornutus* or Jean sotung is doubtless the Coney-fish; but what a ridiculous icon hath he of it. His *Hirundo aquatica* is Salvian's *Milvus*: His *Asellus Indicus* by the name Jacob Evertzen I conclude to be the *Cujupu guacu* of Marggrave, but what likeness of the figures? His icons of the Congri resemble a sort of taenia I have seen and described, more than the conger. His Jean Bouda or *Thynni* species by the pinnulæ on the back and belly appears to be of the Tunny kind; and that is all that either figure or description leads me to say of it. This paper is not big enough to contain a censure of the rest: but in general I reject them all, and do believe they are all mentioned and described by Marggrave or Nieuhoff unless possibly his *Tinca marina*, which in respect of the belly fin agrees with the Garupo of Marggrave. Just now the post

brought me another letter from Mr. Faithorne with an Addition to yours, to which I answer that the *Pastinaca marina* Dioscor, Col. if it be that described in his *Phytobasanos* I presumed to be the same with Rondeletius his, but could not certainly know, because I had not, nor could procure that book to compare the descriptions : and therefore if you find it different I pray insert it.

Schwenckfeld *De Animalibus Silesiae* I have not, nor to remembrance ever saw. His other piece *de plantis et Mineralibus Silesiae* I have often seen and formerly perused. I belive all therein considerable is pillaged by other writers.

If the Bk prints four sheets per week, the book will soon be finished. I wish the Society be reimbursed : the charge is great. But I hope the beauty and elegance of the sculps besides their likeness will invite curious persons to buy the Book. As for me a much lesser number of books is more than I desire or expect. The *Polypodium plumosum* so called I am informed by Mr. Newton to be a native of Wales and so I have entered under another name : why they call it *plumosum* I am to seek.

J. R.

By this week's carrier Mr. Faithorne may expect more copy from me. I will endeavour there may be as few transpositions of chapters as may be, but *secundæ cogitationes sunt meliores* and it would be too much for me I see reason to transpose a chapter or title to write it over anew.

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At a meeting of the Royal Society four days later, it was ordered that Henry Faithorne should print Ray's *Historia Plantarum*.

Robinson resigned the secretaryship of the Royal Society in the following year, and a year later we find him writing to Sir Hans Sloane, under date London, 6 Dec. 1687 :

“The Royall Society declines apace, not one correspondent in being. The revenue is settled upon Mr. Hook, and Monsieur



Papin goes back next week to settle in Germany. The same officers are chosen this year . . . Mr Ray's second volume is now finished, and I have one for you which I will order Mr. Faithorne to send you by the first shipping: you will be able to make many corrections in it and infinite additions"—MS. *Sloane* 4036 f. 30.

And again under date London April 8, 1688:

I have sent you by Captain Brooks Mr. Ray's second volume of Plants, which closes up and finishes the work. You will find a large Appendix at the end which would have been much richer, if your communications and discoveries could have come time enough, (this volume was published 3 months ago). However Mr. Ray designs to publish a second Appendix as soon as sufficient materials come to him. You alone might furnish a vast stock for that purpose, either by dry'd samples, seeds or written observations, Mr. Ray printing them in your name might make you a return suitable to so great a kindness . . . .—MS. *Sloane* 4036.

Eleven letters from Ray to Robinson of the period 1690 to 1694 have been printed in the *Correspondence*, but the contents of later letters can only be inferred from Robinson's letters to other persons. Fortunately he was a voluminous letter writer.

And yet another three hundred letters are known from a list in Derham's handwriting and were presumably once in his possession. They have since been lost, but fortunately a brief summary of their contents is still extant. See p. 285.

## VII.

## LETTERS FROM RAY TO JOHN AUBREY.

1676–1695.

THE correspondence between Ray and John Aubrey,\* the antiquary, is illustrated by twenty letters written between 1676 and 1695, of which fourteen are by Ray and six by Aubrey. The Ray letters are contained in a volume of letters to Aubrey which passed to the Ashmolean Museum after his death, and from the Museum to the Bodleian Library in 1860, where they are now shelf-marked “MS. *Aubrey* 13.”† The letters from Aubrey seem to have been consulted by Dr. Lankester, and portions of them were printed by the Ray Society in 1848, but as their present provenance is unknown to me it has not been possible to reprint them in full.

In 1676 John Aubrey, some two years senior to Ray, was already fifty years of age. Owing to various lawsuits he had been compelled to part with his Wiltshire estates and was about to part with his books as well. This may explain why so assiduous a collector should have published nothing during his active years, for his curious volume of *Miscellanies* was the only

\* Mr. G. S. Boulger drew attention to these letters in his *Unpublished Material relating to John Ray*.—*Essex Review*, xxvi, 1917.

† The British Museum has a copy in MS. *Egerton* 2231.



book printed in his lifetime, and that only in the year before his sudden death at Oxford in the June of 1697.

He had been admitted to the Fellowship of the Royal Society in January, 1662-3, and a few years later, when the finances of the Society were in low water partly owing to the failure of the greater number of the Fellows to pay their subscriptions, and the officers were taking stock of the possibilities, Dr. Goddard reported that Aubrey was a "zealous member" of the Society. "They made him their drudge, for when any curious experiment was to be done, they would lay the task on him." He was then working in co-operation with Hooke, and it will be noticed that the earlier of Ray's letters are addressed to him at Dr. Hooke's Lodgings in Gresham College.

Ray's first letter to Aubrey is a reply to one dated April 11, 1676, not now extant, which indicates that the writer was aware of Ray's desire to increase his slender means by taking a tutorship, though not of his disinclination to travel abroad. The second and third letters show that he did indeed accept a tutorship in the family of Mr. Edward Bullock of Falkbourn, in Essex. The Falkbourn estate had been purchased in 1637 by the Sir Edward Bullock who died in 1644, having married Elizabeth, daughter of Thomas Wyld, of Glazeley Hall, co. Salop, who is likely to have been akin to Aubrey's worthy friend Edm. Wyld, mentioned in his letter of August 5, 1691.\* Ray by his replies shows that he well understood the nature of his correspondent, who combined a love of gossip with antiquarianism and an interest in the strange happenings

\* *Corr.*, p. 237.

in the supernatural beyond the world of science. But that Ray helped Aubrey in scientific matters is confirmed by his annotations to the *Natural History of Wiltshire*, which with some corrections are reprinted below.

57. MS. *Aubrey* 13 f. 168.

SUTTON COFIELD, Aprill 18, [16]76.

Sr,

Yrs of Aprill 11th came not to hand till Sunday last, else you had not so long expected an answer. The motion that it imports of travelling with Sr Francis Rolls his son, were I a free man & competently qualified for such a charge, I should most readily embrace. Common fame, and especially yr commendation induce me to believe Sr John to be so ingenious & worthy a person, that it would be a great happinesse to me, to have any Relation to him, or acquaintance with him. But, to say nothing of my insufficiency, travelling beyond sea is not consistent with my present Relation & state of life, so that I am necessitated to refuse so agreeable an offer. Be pleased therefore to make tender of my very humble service & thanks to Sr John, & acquaint him with so much. I heartily wish & hope the young Gentleman may meet with a person a thousand times more fit to guide & advise him than I am. And to your self Sr, I return many thanks for this & former favours, of wch though I never had opportunity to professe so much, I alway retained a gratefull sence. And I further desire that when you happen to see, or when you write to Dr. Paschall, you would signifie to him that I received his papers & thank him for them; & that if those trifles to wch they relate, ever come to a second impression, I shall with his leave insert ye contents of them in their proper places. So I take leave and rest,

Sr, Your obliged and very humble servant,

JO: RAY.



[To this letter the following note is added by Aubrey:]

“A Non-Conf[ormist] advised Sir Fr. Rolls to send his sonne to an able Divine that taught schoole at Newington, to ground him well in his Religion, before he travelled. His sonne was sent thither, where within a 12 month the schoolmaster married him to his niece, ten years older: & he was his father's only sonne.”

60. MS. *Aubrey* 13 f. 169.

[Cover lost.—For JOHN AUBREY Esq. at Mr. Hook's lodging in Gresham College ?]



FALBOURN, March 3, [16]77.

Honoured Sr,

I recd formerly a letter from you concerning a proposition concerning ye Secretaryship of ye Royall Society, to wch I returned no answer, because I had before by Mr. Martyn acquainted some of ye Society with ye reasons why I could not accept of such a place, wch were partly the consciousness of my inability to manage it, but chiefly its inconsistency wth my profession. Howbeit I am very sensible of the obligation you laid upon me by so eminent an expression of reall kindnesse, & could scarce satisfy my self in neglecting to return you humble thanks (wch now I doe) with the common excuse of not giving you unnecessary trouble.

In answer to your present letter, there hath not to my knowledge been published any generall History of Plants since Bauhinus'.\* Yet is not that ye most full and comprehensive book of that subject extant; Parkinson's Theater & Garden together containing many more species: & no wonder, seing Bauhinus his History, though published since, was written before

\* J. Bauhin, *Historia plantarum universalis*, 1650-1.

Parkinson's. Caspar Bauhinus (younger brother to John) his *Theatrum Botanicum*, of wch the *Pinax* is extant, had ye Author lived to publish it, would have been the most perfect and compleat work of this kind that ever was put forth, taking in all ye species that had been described either by others before him, or newly by himself: but since his death there hath been only ye first tome printed, his son & executors finding I suppose the charge of proceeding with ye edition of the next too immense for them. But what & how many books besides Jo: Bauhine's history doe comprise ye generall History of Plants yet extant I cannot certainly resolve you: because he lived not to finish his history & so I cannot tell whether he hath taken in all the plants described by those that wrote before him, nor can I tell exactly when he died, & so what books of Plants have come forth since that time. Yet I suppose that his history, together with what Fabius Columna, Prosper Alpinus, Cornutus, our Parkinson, Geor. Marggravius, Dr. Morrison, & Paulo Boccone have written concerning plants,† doth compleat the History of all yet extant, except some few stragglers, whose descriptions are scattered heer & there in narrations of voyages & Travels, Catalogues of gardens & Musea, Philosophick Transactions, &c. I heer make no mention of Johnson's *Dendrologia* because I have not read & examined it, & because in his other works I find him a meer plagiary & compiler of other mens labours. Our Parkinson I put into ye number, because there be many plants in his work, not elsewhere described.

Concerning ye improvement of ye *Real Character*‡

† F. Columna, *Phytobasanos*, 1592; *Ecphrasis*, 1616.

P. Alpinus, *De plantis Aegypti*, 1592; *De plantis exoticis*, 1627.

Cornutus, *Canadensium plantarum historia*, 1635.

Parkinson, *Paradisus*, 1629; *Theatrum*, 1640.

Piso and Marcgrav, *De Indiae historia naturali*, 1658.

Morison, *Præludia botanica*, 1669; *Umbelliferarum distributio*, 1672.

P. Boccone, *Icones plantarum Siciliæ*, 1674.

Johnson, *Dendrographia*, 1662.

‡ Wilkins, *Essay towards a Real Character & a Philosophical Language*, 1668.



I have nothing to adde, having not lately spent many thoughts in the consideration of it. One favour in reference to the Latine copy of that book I have to beg of you ; that is the use of the tables of plants for some short time. The reason of this request is, because I intend shortly to publish a Generall method of Plants, wch I hold my self obliged by promise for to doe, and have been lately solicited by friends speedily to make good [my] word. Those tables I drew up for the Bishop with all ye u[ ] and exactness I could with subserviency to his design, but h[ave] not my self any copy of them. They would much ease and assist me [in] the design I am upon ; I shall be careful to remit them when ever you shall appoint. I suppose there are among the Bishop's papers those very tables I sent him, written with my own hand, so that if they can be found, the fair copy of the work need not be mutilated by taking them out there, & sending them. If you please to send them by Jo. Fox(?), one of ye Braintree carriers, who innes at ye Pewter-pot in Leadenhall street, & comes out of town on Friday morning weekly, they will be sure to come to me : or if it be more easie, doe but send them to Mr. Martyns the bookseller & he will take care to convey them hither. I beg your pardon for this hasty scribbling and rest,

Sr, Your very much obliged servant,

Jo : RAY.

Mr. Bullock sends his humble service to you, please to [ren]der mine to Mr. Hook.

61. MS. *Aubrey* 13, f. 170.

To his honoured friend JOHN AUBREY Esquire at Mr. Hook's lodging in Gresham College these present.

London.

( $\frac{MA}{10}$ )

FALKBURN, May 8, [16]78.

Sr,

The date of this will acquaint you w<sup>n</sup> yrs came to hand. Sr John Hoskyns, in whose behalf I now perceive

you proposed ye Queries in yr former letter, though personally unknown to me, I have heard so much & so well of, not only by common fame, but from such whose reports I can rely on, that I verily believe him to be a Gentleman of great worth & honour, & should upon that account only be most ready to serve him in any thing I am capable. Be pleased to tender my most humble service to him, & communicate what follows.

Fab. Columna hath put out two books of plants, the one entitled *Phytobasanos*, wch I have not, the other *Minus cognitarum variorumq in nostro cœlo stirpium Ecphrasis*, wch I owe to ye generosity of my honoured friend Chr. Hatton Esquire. Those books contain the histories of many plants by him first found out & described: all wch are taken in by Parkinson into his work, unless perchance some omitted by negligence or forgetfulness. I doe not wonder that Sr John should not meet with Columna's pieces in London. I enquired diligently for them in Italy, in those cities where they were printed and elsewhere, but could hear no news of them: nor doe I think they are any where to be found but in publick libraries & some curious persons hands. As for Parkinson's *Theatre*, First he takes in all the plants contained in C. Bauhine's *pinax* (wch were all then described by any author before him, Columna & Alpinus included, & above 600 new ones of his own observation: a catalogue of wch authors works, their titles, number of figures & editions you have prefixed to that work. To wch 2ly he addes the *Canada* plants of Cornutus; some out of Ferrarius his *Flora*\* and Tobias Aldinus his *hortus Farnesianus*, published since Bauhine's time; and 3ly some hundreds of new ones, that is, not set forth before in print, wch he took partly out of Lobel's papers by him purchased, & partly had the seeds & patterns of [plants] from Wm. Boel a Frenchman, as I remember, & a skilfull herbarist, who travelled Spain in quest of Plants,

\* J. B. Ferrarius, *De florum natura*, 1633.



Parkinson saith at his charges, & brought over the seeds & samples of many non-descripts, & from Jo. Tradescant, who brought home sundry rare Exotics out of Virginia. Some few perchance might be of his own discovery. But what the number is of those by him first set forth, I cannot make any near guesse, not having at present the book by me. Indeed to enumerate them exactly, should I endeavour it, would be very difficult, not to say impossible, by reason of the brevity & obscurity of some of his descriptions containing only generall notes, & for that he tells us not whether they are of plants already described or not. However I am sure they amount to some hundreds. But enough of him.

True it is Sr, that Divinity is my Profession, yet not lately by me undertaken, but before I left the University, wch is now more than 16 years agoe. The study of plants I never lookt upon as my businesse more than I doe now, but my diversion only; wch yet since I am not qualified to serve God & my generation in my proper function, I have been more bold to bestow a good proportion of my time on: nor have I yet given it quite over: so that I have no thoughts of parting with any of my books upon that su[b]ject]. Mr. Willughbye's library remains at his house at Middleton in Warwickshire, & is reserved entire for the use of his son & [heir?]. I did suppose that the Latine copy of the *Real Char[acter]* had been in your own or Mr. Hook's hands, when I wrote to you requesting for a while ye use of my papers, else I should not have presumed to have given you any trouble about it. I am glad you have gotten so able an interpreter to translate that work into French.\* Certainly it would be an excellent work were it not for the two objections I mentioned formerly, the one rendering it hardly practicable; the other rendering the tables lesse naturall & Philosophicall. Whereas were the tables composed by ye skilfullest Philosophers & artists in every kind,

\* Dr. Lewis du Moulin. *Letter of Aubrey to Ray of May 7. Corr.* p. 128.

without any contemplation of, or respect had to the character, though the character should never be of use in commerce, the tables would certainly be the best systeme or compend of Philosophy extant. But I fear it will be impossible to accomodate the character to ye tables so composed, & that there must be something of institution in it. However take ye work as it is, it far excels any essay of that kind before published; & great pity it is so much cost & pains should be lost, as have been bestowed upon it.

My stays at London are so short, that I can hardly spare time from my small affairs there to wait upon my friends as I will gladly doe, seing they desire it, were it but to tell them *viva voce* what a gratefull sence I have of their kindnesse & good will. Mr. Bullock,\* in whose house I live, is at present in London, where, I suppose you may ere this time have seen him. I take leave & rest,

Sr, Your much obliged and very humble servant,

JOHN RAY.

**62.** MS. *Aubrey* 13, f. 181.

[Probably from Falkbourn in July or August, 1678, in reply to the letter of Aubrey's, dated July 9, 1678, in which he alludes to his friend Paschall's tabular classification of plants. The matter is again mentioned in a letter dated 16 August, 1678. "Good Sir, Oblige that learned person Mr. Ray to draw up (as you had promised) Tables of Plants—And to add others of Animals and that according to the nature of things, and not with regard to a particular institution."—*Letter of Paschall to Aubrey.* MS. *Aubrey* 13.]

Sr,

Your former letter made me presume you were down in ye countrey when I was last in London else I

\* In 1694 Ray dedicated his *Stirpium Europæanorum Sylloge* to Edward Bullock.



might have spared a little time to have waited upon you, though my stay in town was not above 6 or 7 hours. I had ere this time finished my promised tables of plants, could I have obtained the use of those I drew up for the B[isho]p. I was at Dr. Tillotson's house\* to have spoken with him my self, & desired ye perusall of those papers but he happened to be then from home, so that I was frustrated in that attempt. I could proceed without them, but it would cost me double ye pains, & possibly too after all I might misse of some of ye notes that are there. As for tables of Animals, there are in Mr. Willughby's Ornithology two of Birds as exact as I can contrive. I have also drawn up some of fishes for their history when ever it shall be published, which if you please upon notice given I shall send you copies of Tables of Quadrupeds; few that have any skill in Zoology but can make as good as ye subject will permitt. Tables of insects you will scarce meet with better than those Mr. Willughby drew for ye Latine edition of the *R[eal] Ch[aracter]*, though to give Aldrovand his due, his table of insects prefixed to his history is no ill one. I should be very glad to be any way subservient to your worthy designs of advancing reall knowledge & ingenuity. I take leave & rest,

Sr, Yours in all service,

JOHN RAY.

Mr. Bullock at present is in Suffolk.

83. MS. *Aubrey* 13, f. 172.

BLACK NOTLEY, Febr. 15, [16]87.

Sr,

The obliging expression in the front of yr letter received last post of cordiall affection to a person of so mean condition ought not to be passed over without due acknowledgement of debt, & profession of gratitude

\* Archbishop Tillotson married Bishop Wilkins' stepdaughter and lived in Chancery Lane in a house where Wilkins died in 1672.

& reciprocall love ; as neither your frequent commendations sent by my hon[ou]red friend Mr. Bullock. As for the other contents thereof, your remark concerning Elms being found no further North then Stamford, I observed not, by inadvertency I suppose, but believed & have written the contrary. Your observation confirms Mr. Evelyn's opinion of Elms being originally strangers & no natives of England, at least countenances it.\* The Plant enclosed found upon Arncliffe I take to be no other then *Gnaphalio vulgari similis* J.B. entered in my English Catalogue. The other Plant pasted on to ye paper is the same wch in the sd Catalogue I have inscribed *Lichen terrestris cinereus*, & is common in all Counties of England, so that ye Gentleman who told you it was ye starre of ye earth was none of the most cunning Herbarists.

The plant you found on the Downs resembling wild thyme was (I believe) the common *Chamæcistus* or dwarf Holy-Rose.†

The *work you design* (an Interpretation of names of places in England)‡ must needs be acceptable to all ingenious persons if well performed, as I promise my self it will be by so able & judicious an undertaker. For my part I am able to contribute nothing, as having no skill in the Saxon or Welsh tongues. Of the Saxon there is a good Dictionary extant ; the Welsh you inform me is very imperfect. Ancient Records & muniments would be very helpfull, as I conceive ; but I need not hint any thing to you of that nature.

In yr Welsh voyage if you meet with any thing extraordinary relating to naturall history or experiment, be pleased to impart it, & you will lay a further obligation on

Sr, Your most humble servant,

JOHN RAY.

\* *Ulmus surculosa* Stokes, which propagates itself by suckers, not *U. montana*, the Wych Elm.

† Holy Rose, *Helianthemum Chamæcistus* Miller.

‡ Note added by Aubrey.



105. MS. *Aubrey* 13. f. 173.

BLACK NOTLEY, Aug. 17, [16]91.

Sr,

In answer to yr kind Letter wch I not long since received, first I am no lesse sorry then you for ye mistake of yr Christian name, wch I shall be careful to correct in the next edition. I was too confident of my memory, wch is now grown too slippery & treacherous to be trusted. As to ye advertisement concerning the Lime-trees, I am suspicious that your Informers might mistake the *Tilia minor*, wch growes frequent in this Countrey as well as other parts of England, for the *Tilia vulgaris*, & desire to be fully satisfied in that, wch I can hardly be without seeing a specimen of the tree.

I thank you for ye note about Shave grasse, I never saw it growing wild but in one place.

I am easily induced to believe there may be more sorts of Withyes then I have taken notice of, & should be beholden to ye Gentleman you mention for giving me the knowledge of any that I have omitted.

In ye Appendix to my History I have set down the experiment of the Plant called ye star of ye Earth,\* wch

\* Star of Earth, *Silene Otites* Smith, whence a cure for the bite of a mad dog could be prepared (*Philosophical Transactions*, No. 187).

The virtues of this plant had been discussed by the Royal Society on May 18, 1687, when, by the King's order, "Sir Robert Gourdon delivered a receipt to cure the bite of a mad dog (*Register*, vii, p. 8: *Phil. Trans.*, No. 187, p. 298), being under the hand of Mr. Thomas Frazier, his majesty's chirurgeon. The chief ingredient of this medicine was the *Star of the Earth*, which grew plentifully about Thetford. Sloane wrote to Ray about it on June 21, 1687 (*Corr.*, p. 194). At the meeting of the Society on July 6, Dr. Robinson, having examined the plant, said it was *Sesamoides Salamaniticum* sive *Lychnis viscosa flore muscoso* C. B., in English *Spanish Catch-fly*. It is described in Ray *Historia Plantarum* ii, inter *Lychnides*. On July 13 Dr. Sloane stated that he knew a man who had cured twenty couple of dogs therewith. Some years later Ray's friend Samuel Dale disproved the *Sesamoides* attribution and referred the Star of the Earth to *Coronopus*. (Dale, *Pharmacologiæ Supplementum*, 1705.)

The complete recipe as extracted from the archives of the Society by Weld, was as follows: "Agrimony roots, primrose roots, dragon roots, single peony roots, the leaves of box, of each a handful; the starr of the earth two handfulls, the black of crab's claw prepared, Venice treacle, of each one ounce: all these are to be bruised together, and boyled in a gallon of milk, till the half be boyled away; then put it into a bottle unstrained, and give of it about three or four spoonfulls at a time, three mornings together, before new or full-moon."

is nothing else but *Lychnis viscosa flore muscoso* C.B., though it be omitted in ye Synopsis.

What Plant it should be they call *Squatmore*\* I cannot conjecture, but I am not forward to believe it is a non-descript, nor can I be satisfied without ye sight of a sample of it. Whether described or no, such an eminent vertue ought to be taken notice of, & recorded somewhere.

The Wild Vine that cured ye gout I suppose is Bryony, but a more full account of ye manner how it is used would be requisite, & acceptable. The receipt of the Meadsweet is also desireable.

I should be very glad to have a sight of your Memoirs of ye Naturall History of Wiltshire for my own information & satisfaction, not that I think my self able to amend any thing in them. I know not what reason you should have of resolving not to publish them. If the book be delivered to ye Braintree Carrier, who innes at the Pewter-pot in Leaden hall street, & goeth out of town on Friday morning weekly, I doubt not but it will come safe to me, & may likewise by ye same means be safely remitted to your hands. I never had any thing miscarry going or coming. I doe believe there is great variety of Plants in that Countrey, & were it well searched possibly some Non-Descripts might be found. I suspect the tree you call Coventree† may be nothing else but the Hornbeam, for of that our Carters make their Whipstocks. And may not your Whiting-tree be the *Aria Theophrasti*, s. *Alni effigie lanato folio* C.B. ? ‡

The Receipt of the partition-pith of the Wallnut for ye Dysentery I have met with in books, but being diffident of it, I did not enter it either in my History or Synopsis.

I have likewise heard of that experiment concerning

\* *Glaux maritima* L.

† Coven tree, *Viburnum Lantana* L.

‡ Whiting tree, *Pyrus Aria* L. The *Villare anglicanum* interpreted, which is with Mr. Anth. Wood.



the eating of strawberries in wounds of the head, being mortall, but did distrust it.

I find by the Titles of your manuscript works you were pleased to communicate that you are not idle. I hope you will in time gratifie ye learned & ingenious by ye publication of them. I believe many would be as desirous to see them as my self.

I return you many thanks for your communications, but especially for your good opinion of me, & kind expressions of affection & confidence &c. resting,

Sr, Your most humble servant,

JOHN RAY.

107. MS. *Aubrey* 13, f. 174.

For Mr. JOHN AUBREY at Mr. Whites the chymist in Holywell in Oxford.

( $\frac{\text{SE}}{22}$ )



BLACK NOTLEY, 7br. 22, [16]91.

Sr,

These are to acquaint you that I have recd not only yr Letter dated at Oxford 7br. 15 by Post, but also yr Manuscript History of Wiltshire by Carrier, wch I read over with great pleasure & satisfaction. You doe so mingle *utile dulci* that the book cannot but take with all sorts of Readers, and it's pittie it should be suppressed; wch though you make a countenance of I cannot perswade my self you really intend to doe. I find but one thing that may give any just offence & that is ye Hypothesis of ye Terraqueous Globe, wherewith I must confesse my self not to be satisfied. But that is but a Digression, & aliene from your subject, & so may very well be left out. I find little

\* In this and later letters Ray used an armorial seal in place of the Bird seal previously used. The coat *On a fess between three crescents as many fleurs de lis* is that of the Oakeley family into which Ray married.

in ye phrase or expression to except agst. I am not critick enough to censure any man's writings. Some words I have noted that doe not sound well to my ears. You are not ignorant how Mr. Boyl hath been κωμωδούμενος for some new-coyn'd words such as ignore & opine. Cæsar, I think, saith that *Verbum insolens tanquam serpulum fugiendum est*. I'll name you one or two; to apricate, suscepled, vesicate, continently put as opposite to incontinently. I observed some particulars to be repeated, but that is excusable in such a work, & there may be reason enough to warrant it. A great number of *lacunæ* there are wch you must endeavour to fill up as far as you can before it be published. Two things I desire satisfaction from you in. 1. Where Signor Casini makes mention of ye consummation of one of Jupiter's satellites, whether in any printed book; & whether there is really any losse of one of those satellites, or remarkable change of it into a Comet observed by any other. 2. What Authority you have for fishes not being found in ye deep seas. That Fish will live a long time with water alone, & grow to a great bulk is clear by the experimt of Rondeletius. These particulars I may make use of & therefore desire a full confirmation of them.

Please to return my service to Mr. Bobert\* and my very good friend Mr. Lloyd.† They can satisfy you that *Tilia vulgaris platyphyllos* & *Tilia folio minore* are two really distinct species. *Sed vulgus non distinguit*. This latter, whatever those Gentlemen you mention say, I believe is not to be found wild in England. The trees at Newhall are of the first kind, & were, I have heard, brought out of Holland.

I am very glad that Mr. Bobert hath been so diligent in observing & making a collection of Insects, he may give me much assistance in my intended Synopsis of our English Animals & Fossils, & contribute much to the perfecting of it. But this will be still a work of

\* Jacob Bobart, the Younger, Keeper of the Oxford Physic Garden.

† Edward Lhwyd, see p. 185.



some years, & God knows whether I shall live to finish it.\* I rest,

Sr, Yours in all offices of love & service,

JOHN RAY.

This letter has been annotated by Aubrey:

“You speake not of ye Herball part, nor of my designe at ye Apothecaries.

This Hypothesis is Mr. Hooks. I say so, and it is the best thing in the Book; it (indeed) does interfere w[ith] ye 1 chap. of Genesis.”

Ray's interest in Aubrey's projected book on Wiltshire is further illustrated by his own notes.

According to a letter written to Antony Wood on May 11, Aubrey completed the last chapter of his *Natural History of Wiltshire* on April 21, 1686, although the work had been practically finished at Gresham College in the preceding June. Owing to the uncertainty of human life, he bequeathed the book to Robert Hook on August 18, 1686, and there the matter appears to have rested until on 15 September, 1691, he sent the manuscript to Ray, who read it, added the following notes, and returned it to Aubrey on October 27, 1691, with a strong recommendation to him to “speed it to the Presse.”

#### RAY'S NOTES TO AUBREY'S MS. NATURAL HISTORY OF WILTSHIRE,†

15 SEPTEMBER TO 27 OCTOBER, 1691.

In South Wiltshire the constant observation is that if droppes doe hang upon the hedges on Candlemas-day that it will be a good pease yeare (Aubrey).

\* Parts of the work appeared in 1693 and in 1705.

† From J. Britton's edition of 1847.

“ This is a general observation : we have it in Essex. I reject as superstitious all prognosticks from the weather on particular days.”—J. R.

According to Aubrey the discovery that peat is a vegetable was first made by Sir Christopher Wren. One of Wolsey’s conduit pipes at Hampton Court being stopped, Sir Christopher commanded to have it opened, and they found it choak’t with peate.

“ I believe that in ye pipes was nothing else but *Alga fontalis trichodes* C.B. which is often found in conduit pipes. See my *Synopsis*.” J. R.

*Ericolevis Neapolitana*, small bank cresses of Naples, appeared all over the ruins after the Great Fire of London. Tho. Willis told Aubrey he knew before but in one place about the town at Battle Bridge by the Pindar of Wakefield.

“ It grows abundantly by ye waysides between London and Kensington.” J. R.

“ An Hypothesis of the Terraqueous Globe ” was the title of a chapter in Aubrey’s *Nat. History of Wiltshire*. He describes it as a digression ; *ad mentem* Mr. R. Hook R.S.S.

“ I find but one thing that may give any just offence ; and that is, the Hypothesis of the Terraqueous Globe, therewith I must confess myself not to be satisfied : but that is but a digression, and alien from your subject and so may very well be left out.” J. R.

Ray’s work on *Chaos and Creation* published in 1692, a year after date of letter to Aubrey, was a far more valuable contribution to the science of geology.

#### OF PLANTS.

In Bradon Forest grows a blew grasse they call July-flower grasse, which cuts the sheepes mouthes ; except in spring.

“ I suppose it is that sort of *Cyperus* grasse which some herbarists call *gramen caryophylleum*.” J. R.

“ Argentina (wild tansey) grows for ye most part in places that are moist underneath, or where water stagnates in winter time.” J. R.

“ We have no true black mayden-hair growing in England. That which passeth under that name in our apothecaries’ shops, and is used as its *Succedaneum* is *trichomanes*. Calver-keys, hare’s parseley, mayden’s-honesty, are countrey names unknown to me. *Carthamus* growes no where wild with us. It may



possibly be sown in ye fields, as I have seen it in Germany.”  
J. R.

“Sweet fern is the vulgar name for sweet cherill or cicely ; but I never found that plant wild in England.” J. R.

“Goat’s-rue : I suspect this to be a mistake ; for I never yet heard that goat’s-rue was found by any man growing wild in England.” J. R.

“Naked-boys is, I suppose, meadow saffron or colchicum, for I doe not remember ever to have seen any other sort of saffron growing wild in England.” J. R.

At Twyford the floted meadows are white with little flowers  
“*Ranunculus aquaticus folio integro et multum diviso, C. Bauhini.*”  
J. R.

“There is a mistake in thorowax, or *perfoliata* ; for that rises to a good stature, and hath no such flower [a pretty little yellow flower. A]. I suppose the plant you mean is *Trifolium corniculatum* or bird’s foot trefoil.” J. R.

OF BEASTS,

“The otter hath a hairy round tail, not like the beavers.”  
J. R.

108. MS. *Aubrey* 13, f. 175.

For Mr. JOHN AUBREY at the Tobacco-roll and Sugar-loaf at the upper end of Mayden-head lane neer great Russell street in St. Giles

London.

(NO  
19)

Seal

Nov. 18, [16]91.

Sr,

Your Letter dated Novemb. 12 came not to my hands till this day noon. Had you sent it by Post I had recd it last Friday. Upon reading of it, finding that you had not received your Manuscripts I was much surprised & startled. I sent them inscribed according to your Directions this day fortnight, & inclosed therein an open Letter to you. Such an Accident as this never yet befell me, & ’tis too soon now. The Carrier is now gone up to London, so that I cannot examine him about it. You know where he

innes, & this will come to your hands before he goes out of town. If it be not casually drop't out of the wagon, I doubt not but we shall retrieve it. The losse of it would be inestimable. I laid a strict charge upon my man to see it carefully lodged in the wagon. Only I was deficient in not giving you advice by Post, being as it seems too confident of safe carriage & arrival at your hands. So in hast I take leave & rest,

Sr, Your very humble servant,

JOHN RAY.

In the summer of 1692 Aubrey visited Ray at Black Notley and perhaps left his MS. *Adversaria Physica* there for criticism, sending his favourite *Idea of Education* to John Evelyn with a note, "In case I should happen to die before I call for this Idea, I desire you then to leave it with Dr. Hooke at Gresham College, to be put into my Chest marked 'Idea': wch is full of Books for this Designe."\*

118. MS. *Aubrey* 13, f. 176.

For Mr. JOHN AUBREY at the Tobacco-roll & Sugar loaf at the upper end of Mayden-head-lane opposite the gap in great Russell street/London.

(AV)  
(25)



BLACK NOTLEY, Aug. 24, [16]92.

Sr,

I received your kind Letter, & generous present, for wch I return you many thanks. Your reception & entertainment heer was such as my meanenesse could afford, not such as your merit did exact; & were you not a Philosopher, would rather need excuse, then deserve thanks. The best of it was a hearty welcome. Indeed I think my self obliged to you, for honouring me so far as to be at the pains & expence of such a

\* Letter in *Ashmolean Museum*, dated May 10, 1692.



journey to see me, who could contribute so little to you.

Your *Adversaria Physica* I have read over once, but the variety & curiosity of the matter & observations is such, that I cannot satisfy my self with a single reading. As for the Catts heads,\* all that I know of them I learn'd of you, & therefore can give you no light or information concerning them. But my ingenious friend & neighbour Mr. Allen,† whom you saw heer, intends very suddainly to make a journey to Epsham on purpose to enquire into, & examine all the ingredients of those waters. I understand that in the Earth about those wells of Epsham are found of the *Selenites rhomboides*, wch may communicate some quality to ye waters. When he returns again & brings with him of those minerals & stones, I may be able to give you a better account.

The information concerning the Darters & Vulture, if it come not before Michaelmas, will come too late to be inserted in my *Synopsis Animal. Britann.*‡ I never heard of any Vulture seen in England, I meane wild & at liberty. They tell of Eagles about Tiptree heath, that come over in Summer time, & sometimes have bred thereabouts, & I understand that Totham is not farre from thence.

Mr. Dale§ returns his humble service to you, so doth my Wife and young girls, who are indeed much pleased with the Glasse Microscope. We shall be careful to enquire concerning ancient Coyns or Medals found heerabouts, though they are but rarely met with in this Countrey.

I am very glad that so ingenious a person as Mr. Doody|| is made Keeper of the Garden at Chelsey. I

\* Cats-heads were casts of chambers of Ammonites.

† See Dr. Benjamin Allen (1663–1738) of Braintree: a forgotten Essex Naturalist, by M. Miller Christy, in the *Essex Naturalist*, vols. xvi, xvii.

‡ *Synopsis Methodica Animalium, Quadrupedum et Serpentina generis, Vulgarium notas characteristicas, variorum descriptiones integras exhibens; cum historiis et observationibus anatomicis perquam curiosis.* London, 1693, pp. 344.

§ Samuel Dale, of Braintree.

|| Samuel Doody, F.R.S., contributed to Ray's *Synopsis*, 2nd edit., 1696.

doubt not but he will answer the expectation men have of him, & much promote Botanicks.

I thank you for your good wishes & rest,

Sr, Your obliged friend & humble servant,

JOHN RAY.

119. MS. *Aubrey* 13, f. 180.

[Between August and Dec. 1692.]

Sr,

These are to acquaint you, that I have received both your Letter & your Manuscript *Idea of the Education of Young Gentlemen*: wch I shall diligently read over as well for mine own information, as your satisfaction. By the little tast I have already had of it, I find it deserves to be esteemed by ingenious persons, & cherished by its Authour; but it will (as you foresee) give offence to many, & *irriture crabrones*, so that should you publish it, you would have but little rest. I shall when I have perused it & considered it, give you my further thoughts of it & ye reasons of them; though I confesse I have not spent many upon that subject, nor if I had would my judgmt be considerable, being interested & partial for the present method. No more at present, nor had I indeed written any thing but to satisfy you that your MS. is come safe to my hands.

I am, Sr, your very humble servant,

JOHN RAY.

121. MS. *Aubrey* 13, f. 182.

For JOHN AUBREY Esquire at the Tobacco-roll & Sugar loaf, at the upper end of Maiden-head lane, opposite to the gap in great Russell street / London.

(1Y)  
(16)



[Before Dec. 15, 1692.]

Sr,

Your so long deferring to answer my last, at least to give me notice of the receipt of it, made me suspicious



& apprehensive, that my boldnesse with you in writing my sence might be ungratefull & offensive to you : but your kind Letter recd last week hath ridded me of that fear, & given me satisfaction as to that particular. But yet, give me leave to tell you, that what I wrote I wrote *tibi soli*, with no intention that it should goe any further, or be communicated to any man : for that few Gentlemen are able to bear that freedome I used wth you in discoursing that point, though I now see you are so much a Philosopher that you can. I would not willingly give offence to any man ; but permitt every one to enjoy his own sence concerning subjects that are not of any ill influence or consequence.

Your opinion concerning my doings I behold & accept as an effect of your good will & affection, too much influencing your judgement, not as deserved by me. However by how much the more undeserved it is, by so much the more am I obliged to you for it ; & engaged to endeavour to make it good. That I am not to believe what others say of me when I experience no such thing in my self, I am taught by the *Catunculus puerorum*, a book you are sometimes pleased to quote, where I find, *Plus aliis de te quam tu tibi credere noli*.

Your observations concerning Surrey's Naturall things I should be very glad to see ; for I doe & must acknowledge my self to have been informed by yr writings, & so I believe may others too, were they made publick. I doe therefore again sollicite you to let them come abroad, such I meane of them as are ready for the Presse.

I have seen one of Mr. Houghton's papers, and doe think they may be of use to some men, though not of much to me.

I doubt whether Mr. Molin\* have been so observant of plants as to make a right judgement of the variety or multitude of species in severall Countreys. I have hitherto been of opinion that the further Southward to

\* Probably Dr. Allen Moulin, F.R.S., who described a peculiar kind of sand from Virginia.

ye very line one travels, the greater variety of species occurre, especially if the Countrey be mountainous; for ye mountains of such Countreys give us most of the species of ye Northern ones. However Virginia being a Countrey of so excellent a temper & great fertility as it is, I know not but as to it, he may be in ye right. We have there an able Botanist, who will thoroughly search it, & give us an exact account of all that are to be found there, I mean Mr. Banister.\*

As to ye black of the Beans changing, it will not bear a dispute. In such things as are clear, if any man be contentious, I would permitt him to enjoy his opinion, *Nec ullum ultra verbum aut operam sumere inanem.*

I should have been very glad to have seen you heer, & had some conference wth you, that so you might have thereby been better informed of my weaknesse; & been able to make a better judgement of me.

Now that Mr. Edward Bullock, my honoured & true friend is dead, I come not at Faulkbourn, nor have I seen ye young Squire a great while; indeed he lives for the most part at a good distance from me.

Having thus hastily scribbled over some kind of Answer to all the particulars in yr Letter, I take leave & rest,

Sr, Your very humble servant,

JOHN RAY.

122. MS. Aubrey 13, f. 177.

B.N., 10br. 20, [16]92.

Sr,

Yrs of the 15 Dec. giving advice of your return to London, I recd from ye Carrier Saterdag last. I thank you for your forwardnesse to assist me in my studies, & particularly for the informations sent.

The *Merula aquatica* is no stranger to me. I have found of them in severall places. It is not a whole-

\* The Rev. John Banister, a skilled botanist who went as a missionary to Virginia, where he died from an accident on rocks c. 1694.



footed Bird, notwithstanding it will plunge oftentimes into ye water, & catch fish. See Mr. Willughbyes Ornithology.

The Strange Bird the Gentleman shot & described, I know not what to make of, unlesse perhaps it might be ye *Garrulus Bohemicus*, called by Dr. Lister in English a Silktail, & described & figured in ye *Philosophical Transact.*\* I doe believe it to have been this, the notes well agreeing. I believe Eagles doe frequently come over into this island, & sometimes breed heer. I remember once there was a very great one shot in Bocking, a parish neer us.

The new-England Barberries you write of are I dare say no other than a sort of large Mosse-berry or Marsh-Whort, of wch they make Tarts. I have seen & eat of them sent over hither. They are described by Josselin in his New Englands Rarities. Their Latine name is *Vaccinia palustris*, the Plant *Vitis Idæa Thymi foliis* C.B.

Mr. Dale hath received the seeds of *Virga aurea latifolia* you sent. He was in London last week, heard you were in Town, enquired of you according to ye Directions you gave him, but could get no information where he might find you.

What little yellow Insect you mean found in grounds abounding with Saltpeter I cannot conjecture.

You write nothing concerning the Darters, wch I must therefore let alone, neither give me any further Authorities for Bevers having been anciently found in England.

Your *Adversaria* I have read the second time, & doe esteem it & the rest of your Writings that I have perused worthy the publick view & doe therefore desire you to fitt them for the Presse, that so they may be published in your lives time for your own honour, & the benefit & instruction of others. I must own my self to have been informed in severall things by them, & I know not but that others may be so too as well as I. You

\* Waxwing, *Ampelis garrulus*.

doe now grow well into years & therefore it's time to make hast : if you leave them to be set out by your executors, they will endanger either to be suppressed or carelessly corrected.

I had almost forgotten to adde a word concerning the Plant you call the Couch-bean. Perhaps it may be nothing but the *Trifolium paludosum*.

I have order'd my Bookseller to present you with a Copy of my *Physico-theologicall Discourses* of the 2d edition, of wch I intreat your acceptance.\* My wife gives you her humble service by the hand of

Sr, Yours in all offices of love & service,

JOHN RAY.

I pray give my service to my old acquaintance & friend Dr. T. Gale.

127. MS. *Aubrey* 13, f. 178.

BLACK NOTLEY, July 4, [16]93.

Sr,

I have now received 4 Letters from you ; the second of wch came in your manuscript *Perambulation of Surrey* you were pleased to send me to peruse : wch I deferred not to doe, having received so much pleasure & satisfaction in reading your former Manuscripts. I cannot but very much approve this work of yours, & judge it well worth the printing, as indeed all your pieces that I have seen are : the reason I conceive why Booksellers are shy & fearfull of undertaking them is because you are not yet known to ye learned world by any

\* The first edition of *Miscellaneous Discourses concerning the Dissolution and Changes of the World* appeared in 1692. The second edition was entitled *Three Physico-Theological Discourses* concerning—I. The Primitive Chaos, and Creation of the World. II. The General Deluge, its Causes and Effects. III. The Dissolution of the World and Future Conflagration, wherein are largely discussed the production and use of Mountains ; the Original of Fountains, of Formed Stones, of Sea-Fishes Bones and Shells found in the Earth ; the effects of particular Floods and Inundations of the Sea ; the Eruptions of Volcanos ; the nature and causes of Earthquakes : with an Historical Account of those two late remarkable ones in Jamaica and England. With Practical Inferences.

This edition, much enlarged and illustrated with copper plates, appeared in 1693, and was succeeded by a third edition in 1713.



published work: for if they had but once a tast of your writings, you would not want undertakers for your Copies. Your *Monumenta Britannica* I have not seen, & so am not able to recommend it upon my own knowledge; but it having the testimony & approbation of so great a Critick as Dr. Gale, I may well presume it must needs be good. But to tell you ye truth, this Countrey wherein I live is barren of Wits; heer being but few either of ye Gentry or Clergy who mind any thing that is ingenious. I thought to have sent yr proposals to Mr. Bullock, for I could not wait upon him my self, by reason of ye exulcerated Pernio's upon my legs, wherewith I have been now a long time troubled; but now by a late Letter I understand, that you desist from the design of printing that work by way of Subscription; so I forbore to send it.

In yr *Perambulation of Surrey* I find little to alter or amend, nothing to adde. In Page III a Typographical Errour in my *Syn. Stirp. Britan.* hath induced you to think that there are two rivers of the name of Tame, & two Towns called Tamworth, the one in Dorsetshire, the other in Warwickshire; whereas in truth I know but one of each: in the former quotation Dorsetshire being through mistake of ye compositors put instead of Warwickshire, into which errour I guess they fell by the precedent name Dorsthill running in their heads.

I thank you for the information concerning the Raspes, wch I may have occasion to make use of. I could not but condole with you the troubles & adversities that have lately befallen you.

I shall remit your MS. the next parcel I send to Mr. Smith.\* My wife gives you her humble service. We are all I blesse God in health, & pray the like blessing to you. I am,

Sr, Yours both friend & servant,

JOHN RAY.

In ye same 3d page of your book you put the word

\* Samuel Smith, of St. Paul's Churchyard, Ray's publisher.

synchronism instead of parachronism or some such word ; unlesse you adde, of things or matters distant in time 500 year.

152. MS. *Aubrey*, f. 179.

For Mr. JOHN AUBREY at Mr. Tho. Bridgmans in great Lincoln Inn feilds near the Ld Powis house, a large sun Dyal upon it.



Seal

BLACK NOTLEY, May 7, [16]95.

Sr,

I know not well how to excuse my self for deferring so long to return answer to your Letter. One while I waited to speak with Mr. Dale, he coming not at me, & I being not able to goe to Braintre my self ; afterward I heard that you were out of Town. As to ye subject of yr Letter, I wish I were able to serve you in procuring subscriptions for ye printing of your book. Those writings of yours wch I have seen, in my opinion, deserve to be published, & so I presume doth this piece, & the rest wch I have not seen. But I live in a corner of ye World barren of Wits, & my knowledge among ye Clergy & Gentry doth not extend far, so that I am not able to doe you any service in this matter ; only for my self I shall be very willing to subscribe for a Book, and so will Mr. Dale for another, & he will doe his endeavour to get you other subscribers. As for Mr. Bullock, I hold little correspondence with him : your interest may be greater in him then mine. His father indeed was my very kind & constant friend, but this young Gentleman, though he hath done me good Offices in businesse concerning the publick impositions, keeps at some distance, not coming to see me though he hath often said he would ; & I have not been in case of late to travell so far as to waite upon him.

One request I have to make of you, that is, whether



in that Relation you give concerning ye digging for coal by a certain Minister, as I remember, whether in Surrey, Hampshire or Barkshire I have forgott, there be mention made of any layers of Shells or any dispersed shels to have been digged up ; & if so, of what species they were. For a certain confident Gentleman hath lately advanced a new Hypothesis to give an Account of ye bringing in the sea-shells we find all ye earth over, some dispersed, & some in beds, & of ye disposition of them in that Order wherein they are found. And besides pretends to give an Account of most of ye generall Phænomena of ye Earth & bodies about it & whereof it is composed. I need not name ye Author, for I doubt not but you have read the book. My *Synopsis Method. Stirpium Britann.* is now printing ye 2d time, with ye Addition of above half an hundred new species of Mosses, & of Fuci & Fungi together almost as many.\* But why should I tell you of things done at London, wch you know as well as my self. This place affords nothing of new invention or discovery to communicate to you, so that I have nothing to adde but that I am

Sr, Yours in all offices of love and service,

JOHN RAY.

\* *Joannis Raii Synopsis Methodica Stirpium Britannicarum, tum indigenis tum in agris cultis, locis suis dispositis, additis generum characteristicis, specierum descriptionibus, et irrium epitome. Editio secunda. Lond. 1696.* The first edition appeared in 1690.

## VIII.

THE CORRESPONDENCE BETWEEN RAY AND  
MR. ANDREW PASCHALL.  
1694.

Four letters, all of 1694, from the Rev. Andrew Paschall to Ray have been printed. The second of these, dated from Chedsey, April 24, 1694, refers to a fall of manna in his orchard.\* Ray's reply does not appear to be extant, but Paschall has quoted some lines of it in a letter, dated Chedsey, May 28, 1694, to Dr. Bathurst, president of Trinity College, Oxon.

MS. *Lister* 36, No. LIb.

“Ever honer'd Sir,

I lately receiv'd in a letter from my learned and worthy freind Mr. John Ray these words, ‘I was much taken with your discovery of y<sup>t</sup> kind of aeriall mannah you communicated the knowledge of. It is pittty but what you have noted were drawn up and published, that others may be exalted to make the like in other places.’ His judgement makes me think that a brief account of what occur'd to me in this my country retirement may not be unacceptable to you. . . .”

\* *Correspondence*, p. 279.



## IX.

THE CORRESPONDENCE BETWEEN RAY AND  
EDWARD LHWYD.

1689–1703.

THE correspondence of Ray with Edward Lhwyd, now to be printed for the first time, covers the earlier seven years of their acquaintanceship very fully, the last seven years less fully. After 1695 Ray wrote so frequently to Dr. Hans Sloane that he seems to have had less time for his earlier correspondents. Twenty-six of these Lhwyd letters are in the Bodleian Library in MS. *Engl. hist.* c. 11: they cover the entire period 1689–1703, with the exception of the five years 1690–94, which are represented by another fifteen letters contained in MS. *Ashmole* 1817a.

Lhwyd was some forty years younger than Ray, indeed he was only an Oxford undergraduate at Jesus College when he first addressed letters to the great naturalist. The separation of the shorter series of letters in the Old Ashmolean Library from the longer series is explained by the fact that in 1690 Lhwyd had succeeded Dr. Plot as keeper of the Ashmolean Museum, and that the letters of 1690–1694 were kept there as part of his official correspondence. When the contents of the Ashmolean Museum were distributed during the latter half of the nineteenth century, Ray's letters to Lhwyd were transferred to the Bodleian Library. Lhwyd will always be remembered for his great work for palæontology and for the archæology of Wales.

He died in 1709 “by immoderate application to his antiquarian studies. The immediate cause was sleeping in a damp and close room in the [Ashmolean] Museum at Oxford, which he chose to sleep in, for the convenience of pursuing his studies.” (*Correspondence*, Appendix B.)

**84.** MS. *Eng. Hist.*, c. 11, f. 36.

For Mr. EDWARD LLOYD at Mr. Haughtons at the Black boy in Chancery Lane, London.

(IV)  
(22)



BLACK NOTLEY, June 21, [16]89.

Sr,

I recd your friendly letter with a Catalogue enclosed of some British plants of your own observation, & return you most hearty thanks for them. By comparing this with ye Catalogue received from Dr. Robinson I clearly see that you were ye Author of that, as also I did before suspect. The plants therein contained, that were of new invention, & not mentioned in my English Catalogue, I entred into my Synopsis. However I intend to adde by way of Appendix this whole Paper you sent, (only by yr permission a little altering the order of the Plants) signifying wch are already inserted in the book itself, & where.

1. The first species, wch you entitle *Adiantum trichoides* &c. is a plant not very well known to me, having never seen it growing, but only dried samples of it, & those not very perfect. Dr. Plukenet and others, who have compared both, are of opinion that this is specifically distinct from that sort that grows on ye rocks about Tunbridge observed by Mr. Dare, described in ye Appendix of my history.\*

2. The *Hemionitis pumila trifolia* is a rare discovery. So is 3. the *Sedum serratum flosculis compactis immaculatis*, & indeed all ye rest, wch time will not permit me particularly to mention.

\* Not the true *Phyllitis Hemionitis* but a form of *P. Scolopendrium* (Druce.).



7. I thank you for minding me that ye other species of *Lycopodium* mentioned in my History is indeed the same described by J. Bauhine under ye title of *Muscus terrestris foliis retro reflexis*,\* wch was inadvertently overslipt by me ; who likewise in my description of it omitted ye speciall & characteristick note of its having *Julum singularem*.

12. The *Nasturtium petræum*† of Johns[on] in his *Merc. Botan.* I desire you would give me some light into, I not having at present that book by me. I have, following J. Bauhine, taken the *Nasturtium petræum* Tab. Ger. to be ye same plant with that usually but ineptly called *Bursa pastoris minor*.

*Filicula petræa fœmina* Tab.‡ Tabernamontanus his history is a book I would not, nor could I make use of if I had it, having no skill in high Dutch. I have seen & revised his Icons. But he, as I find in C. Bauhine, describing or figuring 4 sorts of *Filicula petræa fœmina*, methinks the title should be more particular ; & he being an Author not common in England, if this species be described by no other, to wch recourse may be had by the curious for satisfaction, it would be needfull to give some characteristick notes, whereby the plant may certainly be known. The like may be said of the *Adiantum mas* Tab.

22. *Filix minor non ramosa foliis infimis deorsum spectantibus*. By ye synonyme you give of *Dryopteris candida* Dod. I guess this to be ye plant I understand by *Filix pumila saxat. altera* [*S. non ramosa*] Clus.§ For Mr. Lawson who sent it me out of the North, wrote me, that Mr. Watts & Mr. Newton imposed that name upon it, & otherwise I learn that among both our London & Oxford herbarists it hath for many years passed by that denomination. For my part I think that neither figure nor description of Dodonæus agree to it, & therefore consent with Parkinson, that Dodonæus his *Dryopteris*

\* *Lycopodium annotinum* L.

† *Arabis petræa* Lam.

‡ Cf. *Asplenium Adiantum-nigrum* L.

§ Probably *Cystopteris fragilis* Bernh.

*candida* differs from his *nigra* in nothing but the colour of ye stalks, & broadnesse of ye segments of ye leaves, & is only a variety of it. Howbeit I will not be overconfident that this plant is the same with that of Clusius, because it rises much higher, nor doe ye stalks of it ever turn black that I have observed, though the form of it agrees very well. It is common among stones in ye mountainous parts of ye North.

42. I have taken the *Muscus aquaticus terrestri vulgari similis*\* of my English Catalogue to be ye *Fontalis minor lucens* J.B. If I be mistaken, I pray inform me better.

If you would favour me with any further observations or samples of dried plants, after your return to Oxford, they would be to me most welcome, & might be of use in this work, notwithstanding it is already begun to be printed.

I should be ungratefull & unjust should I not acknowledge & commend yr candour in so frankly & readily communicating yr learned & accurate observations & discoveries to an unknown person, to accomplish his work. I shall be carefull to doe you right, & not rob you of any part of that honour & thanks that is due to you from ye curious & ingenious, or any other that may purchase & make use of the *Synopsis Methodica Stirpium Britannicarum* of

Sr, Your very humble svt,

JOHN RAY.

MS. *Lister*, 35, no. 54.

From EDWARD LHWYD to LISTER. Dated Oxon July ye 19th, 1689. [*Addressed*] For Dr. MARTIN LISTER at the Old Pallace yard near Westminster Hall.

“ . . . You will receive together with ye Catalogue some dried plants for Mr. Ray, which I have made bold to direct to you as well because I suspected you might happily desire to see them your self; as in regard I knew not how to convey ym soe safely to his hands by any other means. I could not send him patterns of all ye plants mentioned in my Catalogue, because

\* *Cinclidotus fontinaloides* Beam.



ye Carrier fayld us. I could wish Dr. Robinson would expunge out of Mr. Ray's MS. whatever is therein inserted out of his Welsh Catalogue. For yt I sent Mr. Ray, comprehends all that, and much more. Moreover Dr. Robinson's was never intended for ye Presse; but onely to remain at Llan Berys a village in Snowdon, for the use of such as came thither a simpling, and therefore much of it was writ in Welsh which is soe changed by often transcribing yt I scarce knew it to be that language when Mr. Mod shewd me Mr. Rays MS. One word being sometimes divided into 2 or 3, and elsewhere two or three words united; and in ye 1st printed sheet I met with a Greek word for Welsh. Be pleasd to send ye plants by ye 1st opportunity to Mr. Ray, and if you happen to write to him, to assure him yt few men can be more desirous of frequent opportunities of serving him yn is (according to his capacity),

“Honoured Sir, your most obliged and very humble servant,

“EDWARD LHWYD.”

**85. MS. *Eng. Hist.* c. 11, f. 37.**

For Mr. EDWARD LLOYD at the Museum, Oxford.

BLACK NOTLEY, Aug. 2, [16]89.

Sr,

I recd your friendly Letter of July 21 by Post, & soon after ye parcell of dried plants by Carrier, for wch I return you most hearty thanks. Surveying the plants & comparing with ye Catalogue, I find severall particulars concerning wch I need fuller information from you. And first the Plant intituled *Filix Lonchitidi affinis montana Oxyacanthæ foliis* &c.\* is so like to the leaf of a young plant of *Filix mas non ramosa pinnulis latis auriculatis spinosis Goodyeri* (with wch I compared it) that I can hardly perswade my self that it is a distinct species. I would have sent you some such leaves of that Filix, but that I suppose you doe not want them thereabouts.

2. I find you have given to two plants the name of *Trichomanes aliud foliis mucronatis profunde incisis* Sibbald,† viz. first to ye *Trichom. ramosum*,‡ to ye

\* *Polystichum lobatum* Presl.

† Probably a form of *Asplenium Trichomanes* L. (Druce).

‡ *Asplenium viride* Huds.

specimen whereof it seemeth not to agree, & 2dly to the plant you found in a garden at Snowdon &c.

3. The plant inscribed *An Adiantum album tenuifolium Rutæ murariæ accedens* I find not in ye Catalogue by that name & there is no place added to it in the paper to which it is pasted. So that I am to seek for its place. The leafe seems to me to resemble a young leaf of that I call *Filix saxatilis caule tenuifragili*.\*

4. The *Adiantum trichoides*† is entred in the Appendix to my English Catalogue, & in my *Synopsis Method*. Dr. Plukenet (to whose opinion I also incline) thinks there are two sorts of it, the one, of wch you sent a sample, *foliis bifidis vel trifidis, segmentis angustis oblongis*; the other growing on ye rocks near Tunbridge,‡ wch hath broader leaves divided into more segments, described in ye Appendix of my History

5. The water-mosse you call *Fontalis minor lucens*§ is common in rivers & rivulets all over England, & in my English Catalogue inserted by ye name of *Muscus aquaticus terrestri vulgari similis sed major [& elatior]* should have been added.

6. That you suspect to be *Plantula Cardamine alterius æmula* Clus. comes near to what I take to be *Barbarea muralis*.|| I never yet had ye hap to see the *Plantula Cardam. alt. æm.* though Mr. Newton found it on S. Vincent's rock. The *Barb. mural.* hath been sent me for it, so that it seems they are very like.

7. That you take to be *Nasturtium petræum*¶ of Dr. Johnson is a plant to me unknown, & may be what he calls so: but that of other authors by ye figure & description seems to me to be all one with *Bursa pastoris minor* improperly so called; though I confesse the leaves of the figure doe not agree thereto.

\* *Cystopteris fragilis* Bernh.

† *Hymenophyllum unilaterale*.

‡ *Hymenophyllum tunbridgense* L.

§ *Cinclidolus fontinaloides* Beam.

|| *Arabis hirsuta* Dr.

¶ *Arabis petræa* Lam.



8. The *Hieracium* of wch you sent a fair plant seems to be of the fruticose kind.

9. Its a notable remark you adde concerning the *Acetosa montana Cambro-britannica*.\* Methinks in ye sample you sent the deliquium of ye leaves, wch Dr. Morison makes its characteristick, disappears, & ye figure of the leafe approaches to that of the Romane Sorrell.

10. The *Cupressus marina Belgica* Clus. I should have intituled *Muscus marinus denticulatus erectus ramosus*, it resembling ye other denticulate Sea-mosses, of wch I have seen many varieties.

11. The *Phyllitidis Species altera tenerior s. Hemionitis* Lob. I take to be no other then ye comon Harts tongue.† I am sure Lobels was so by his own confession. See ye first edition of my English Catalogue in *Hemionitis*.

12. The sample of *Adiantum nigrum pinnulis Cicutaricæ divisura Boberti*‡ is unluckily slipt out of the book & lost, so that I can make no judgement of it. I have observed in ye plant I take to be *Filix pumila saxatilis altera* Clus. the lower leaves sometimes hanging down towards ye root.

I desire to know what the potestas of this character may be. I have inadvertently mistaken it for ye letter y in transcribing the Catalogue.

As for Cutts to my History of plants there are none to be expected; the book sells not so well as to encourage the undertakers to be at any further charge about it. The times indeed of late have not been very propitious to the booksellers trade.

Such of those plants of your observation as are now growing in Oxford garden that are not fully described, as they shall come to their state & perfection I shall begge a further account of from you, & particularly of that Rush-leaved Bulb with single heads. The *Pentaphylloides erectum* J.B.,§ *Veronica spicata latifolia folio*

\* *Oxyria digyna* Hill.

† *Phyllitis Scolopendrium* Greene.

‡ Probably *Cystopteris fragilis* form.

§ *Potentilla rupestris* L.

*splendente & non ejusdem, Lychnis sylv. viscosa rubra angustifolia* C.B.,\* *Sedum serratum flosculis compactis immaculatis*† are brave plants & both for beauty & rarity meriting culture in a garden of pleasure.

This paper being fully charged it is time to give over ; only let me entreat ye the continuance of your correspondence, wch if I should attempt any thing further in Botanicks (as I design not) may be as usefull as otherwise it will be satisfactory to,

Sr, Your very humble svt,

JOHN RAY.

87. MS. *Eng. Hist.*, c. 11, f. 38v.

For Mr. EDWARD LLOYD, the Museum in Oxford.

( $\frac{SE}{12}$ ) Pd. 2d. to London.

BLACK NOTLEY, Aug. 11, 16[89].

Sr,

I am very glad we are come to so good an understanding & almost perfect accord in all the species of Plants of your invention, you were pleased to communicate to me.

Your *Cardamine minor arvensis*‡ from the notes you give of it I conclude to be a different species from, & not only a variety of my *Cardam. impa. altera hirsutior*. The reasons of my hesitancy about that sort of *Cardam. impatiens* that grows among the rocks about Settle, & as you informe me in Wales, whether it be different from ye *Sium minus impatiens* of Alpinus, I have given in the history of those plants.

Give me leave now to desire your resolution concerning a plant or two.

1. Whether the *Anemone tuberosa radice* P.B.§ observed by Mr. Heaton near Black Burton upon Cotswald hills

\* *Lychnis Viscaria* L.

† *Saxifraga nivalis* L.

‡ Probably *Cardamine flexuosa* With. (Druce).

§ *Anemone Pulsatilla* L., and not, as Sibthorp thought, *A. pratensis*.



be known to you, & if so, whether you take it to be a non-descript plant, & can give any further account of it.

2. Whether you know of any such plant as *Lycopsis altera Anglica* Lob. distinct from the common *Echium*.\*

3. Whether the *Abies Taxi foliis* be a distinct species from the *Abies fœmina* of Jo. Bauhine & Parkinson, & if so, wherein they differ. The reason why I make this querie is because I find these two put in ye front of P. Herman's Catalogue of Leyden garden for different kinds, & the *Abies Taxi foliis* made a synonyme of *Abies mas conis sursum spectantibus* C.B., wch I took to be no other then the *Ab. fœmina* J.B. I am sure the *Abies fœmina* J.B. resembles the Yew in the manner of the growing of its leaves.

I do not hear that they have as yet begun to print my Synopsis, so that any thing needfull may be added, omitted or altered. I desired Dr. Robinson (who is now returned to London) to insert in their proper places the plants of your observation, wch I sent him a Catalogue of, disposed according to the order of my Method; whether or no he hath done it I have had no account from him.

That the seeds of Capillary plants doe grow to the back sides of their leaves according to the present opinion of the curious naturalists of our age I think there is no reason to doubt; they having been seen & described by such diligent & criticall observers as Fabius Columna, Wm. Cole, & Dr. Grew: of whose fidelity also I am well satisfied: though I confesse for want of a good microscope I have not observed them my self.

What occurs to you of new or curious in any part of the history of Nature from time to time if you please to impart, you will greatly oblige him who is,

Sr, Your very humble servant & debter,

JOHN RAY.

\* *Echium italicum* L.

MS. *Lister*, 35, No. 56.

From EDWARD LHWYD TO LISTER. Dated Oxford, Aug. 15, 1689. [*Addressed*] To Dr. MARTIN LISTER, at the old pallace yard, near Westminster-hall.

" . . . I find by a let[ter] from Mr. Ray, he has received some dried plants I sent him, and [there]fore may conclude you have likewise received ye Catalogue of shells sent with it.

"I would gladly at your first leisure understand what Mr. Ashmole resolves upon, as to ye Custody of ye Musæum : and I would desire you (if you think it not amisse) to make your request to him plainly on my behalf, when you next meet with him in any tolerable humour. . . . When you happen to discourse with him [Ashmole], you may acquaint him yt if he questions my behaviour in ye Place, he may prescribe me what rules he thinks fit, which if I observe not, I may be dismisd at ye 1st. 2d. or 3d. year. If he supposes you and Dr. Plot may be byassd in your character of me ; I'm willing to be examin'd by Mr. Ray or any other Naturalist. . . .

"I writ to Mr. Ray last Sunday."

EDWARD LHWYD.

**88.** *Eng. Hist.*, c. 11, f. 40.

For Mr. EDWARD LLOYD at the Museum in Oxford.

( $\frac{AV}{20}$ )

BLACK NOTLEY, Aug. 20, [16]89.

Sr,

I recd yrs of Aug. ii & therewithall a great satisfaction from the resolution of most of my Queries : yet some scruples still remain wch I shall now impart to you. And first though I am suspicious that yr *Filix lonchitidi affinis* is no other then *Filix mas* &c. *pinnulis latis auriculatis spinosis Goodyeri*,\* yet if upon cultivating it in a convenient place it doth not produce larger and subdivided leaves, I shall not pertinaciously adhere to my opinion, but condescend to that of yr Oxford herbarists. I have sent inclosed two lower

\* *Polystichum lobatum* Presl. : but Lhwyd's plant may be *P. angulare* Presl.



pinnulæ of a young leaf not much unlike that I received from you, wch was unluckily lost.

2. The reason why I made that Qu. concerning ye *Adiant. nigrum pinnulis Cicutaricæ divisurâ*, was because I find in the book two Tables, one upon a paper with a plant pasted on it, viz. *An Adiantum album tenuifolium Rutæ muraricæ accedens?* the other upon a loose paper without any plant on it, or by it, unlesse ye plant be casually slipt out of the book, viz. *Adiantum nigrum pinnulis Cicutaricæ divisurâ* Bob. *An Filicis pumilæ saxatilis secundæ Clusii varietas?* If these be divers titles of one and ye same plant then I conclude that you and I doe not understand one and ye same by *Filix pumila saxat. altera* Clus. that wch I meane being, as he describes it to be, like ye male Fern for ye fashion of its leaf and pinnulæ but much lesser: to wch the plant pasted on ye paper is in my judgment nothing like, but rather (as I intimated in my former) to ye *Filix saxat. caule tenui fragili*, though different enough from it.

3. The difference of magnitude and stature is no convincing proof of specific difference in plants, but may be owing to the difference of soil or place, & therefore I conclude your *Adiantum trichoides* to be ye same wth Mr. Newtons, but whether it be mosse or fern I cannot easily determine; only I incline to ye latter because Dr. Plukenet hath with his microscope discovered certain bladders on back side of the leafe, probably ye seed-vessels.

4. The plant you supposed to be *Plantula Cardamines alterius æmula* Clus. is not (as Mr. Bobert would have it) the common *Turritis*, but as I am now confidently persuaded, that wch I understand by *Barbarea muralis* J.B.\* wch passed with us at Cambridge for many years by the name of *Cardamine pumila Bellidis folio* i.e. *Plant. Cardam. alt. æm.* Clus.† & possibly may be ye same with it only. Clusius's plant is

\* *Arabis hirsuta* Br.

† *Arabis petræa* Lam.

described much lesse, & in fewer flowers and cods & those not so furred & creeping roots. The description of *Barbarea muralis* in J. Bauhine agrees much better & more exactly to this plant; so if *Barbar. muralis* & *Plantula Card. alt. æm.* doe differ specifically this must not be the latter. Indeed the sample of *Plant. Card. alt. æmula* gathered by Mr. Newton on St. Vincents rock, & shown us by him, did very much resemble Clusius his figure in all respects. But though I deny this plant to be ye common Turritis, yet is it in my opinion a species of Turritis: so far I agree with Mr. Bobert.

5. Dr. Johnson's *Nasturtium petræum* I wish you could give a little more light into, concerning the bignesse & colour of the flower & the manner of ye seed vessels, wch by ye intermediate membrane remaining seems to be a *siliqua*.

6. Another question I have to ask you concerning a plant in your former Welsh Catalogue inscribed *Cardamine minor arvensis* found in Shropshire and Montgomeryshire in gardens & among the corn. Whether it be not that wch I have intitled *Cardamine impatiens altera hirsutior*, *Sisymbrium Cardamine hirsutum minus flore purpureo* J.B.\* Or whether it be the same wch is frequently found about London on moist ditch banks in ye Spring; taken by some to be ye *Sium minimum* or *minus impatiens* of Alpinus, but erroneously. I take those two to be distinct plants, but am not yet fully satisfied, as you will find if you please to consult the first volume of my *History* p. 815.

This paper being fully charged, its time that I make an end, wch I shall doe when I have told you that I am

Sr, Your obliged friend & humble servant,

JOHN RAY.

\* The two allied plants *Cardamine hirsuta* and *C. flexuosa* may have been confused (Druce).



89. MS. *Eng. Hist.*, c. 11, f. 41.

For Mr. EDWARD LLOYD at the Museum in Oxford.

BLACK NOTLEY, Sept. 26, [16]89.

Sr,

Yrs of Sept. 22nd came to hand last Post. You rightly conjectured that the samples of plants you sent were not dispatched hither by Mr. Motte so soon as they might have been ; I suspect not before he was quickened by your Letter, for I received them not till ye beginning of this week, two days before the receipt of your Letter.\*

In ye first place I return you thanks for the resolutions given to my queries, yet I suspect that there doth grow some kind of *Anemone* upon Cotswald hills, because Mr. Heaton, whose name is to it, was a man of competent skill in Botanicks, & an honest person, of whom I had some knowledge.

As for ye *Lycopsis altera Anglica* Lob. I always took it for a fancy, because Lobel makes it common in ye way between Bristow & London, where no man besides him could ever find such a plant.† Possibly it may grow in Jersey. I acknowledge the *Lycopsis Dioscorides quibusdam* J.B. but not for an English plant.

Please to return my humble service & thanks to Dr. Plot, & acquaint him that I have been long since

\* Two letters from EDWARD LHWYD to, presumably, LISTER refer to this transaction.

“ Oxford, Oct. 1, 1689.

“ . . . I sent an other parcel of Welsh Plants to Mr. Ray about 6 weeks agoe and directed them to be left with Mr. Mot, his Printer ; but Mr. Ray receivd them not in any due time, nor am I sure whether he has yet receivd them, I writ to Mr. Mot yt I had sent 'm by Dr. Bartlets coach which lies at ye Oxford Armes in Warwiclane. . . .”

“ Oxford, Oct. 14, 1689.

“ . . . I have received a civil letter from Mr. Mot, assuring me he neglected noe time of sending ye Plants to Mr. Ray, with an other from Mr. Ray giving account he receivd them, etc. I thought it Mr. Mot's more immediate concern than any others, for I apprehended that he Prints it for himself and not for any Bookseller. Mr. Ray says he will endeavour to have one or two of my Plants engravd for ye Ornament of his *Synopsis methodica*. . . .”—(Letters 57 and 58, MS. *Lister* 35.)

† Lobel mistook a form of *Echium vulgare* for *E. italicum* (Druce). There is no proof of *Hemionitis* being found as is suggested.

assured by some Kentish Gentlemen, that their Horse-beech is no other then the Hornbeam tree or *Carpinus*. I also desire his judgement of the *Sorbus* mentioned in his *Naturall History of Staffordshire*, whether it be a tree specifically different from the *Sorbus legitima s. sativa*.

I thank you for the elegant draught of the *Hemionitis pumila trifolia* & shall endeavour to get it engraven for the ornament of my book. The enclosed plant but for ye smallnesse of it I should affirm to be my *Lunaria vasculo sublongo intorto*.

My fasciculus conteins all the new species of my Synopsis, excepting those of your contribution, one or two of Dr. Plots in his *Hist. nat. of Staffordshire* wch were by oversight omitted, & one of Mr. Lawson's, wch I have entitled *Allium montanum amphicarpon, foliis porraceis, floribus & nucleis purpureis*. An *Allium s. Moly montanum* *I<sup>um</sup>* Clus. ? \*

This is not the first time I have been told of Mr. Sherard being so qualified as you represent him, I should be ambitious if it may not be of his acquaintance yet at least of his correspondence, & shall thankfully accept any thing he shall please to communicate tending to the perfecting of my Book.

And now I think I have answered all the particulars in your Letter, it remaines I return something to yr queries concerning the dried plants: for resolve them I cannot, most of them remaining no less doubtfull to me then your self.

And first of all the *Filix minor non ramosa pinnulis imis deorsum spectantibus* comes so near to what I call *F. pumila saxat. altera* Clus. that I suspect it to be only a variety of it.† It differs indeed from a dried sample I have of that in being much lesse & having slenderer stalks, wch may be because it is a younger plant. I observe also that ye wings or side-branches

\* *Allium Scorodoprasum* L.; but Ray, *Syn.*, puts Lawson's plant under *A. oleraceum* L.

† See p. 187.



of ye leaf are exactly opposite one to another, wch is not so in mine : but neither is that a sufficient note of specific difference, for ferns of the same kind varie in that respect.

The 2d without name I doe not remember to have seen any Capillary exactly like to : but yet the leaves being of a young plant, not yet grown up to its perfection I dare not pronounce any thing concerning it.

The 3d or *Filix lonchitidi affinis*\* differs so much in the greatnesse of the stalk & shortnesse of the alæ from ye *F. mas non ram. pinn. latis auriculatis spinosis Goodyeri* that if ye leaves of the old roots when adult are all like this, I should pronounce it a different species ; though the first leafe you sent me was so like the leafe of a young plant of that, yet I could not but think it the same.

The 4th doth as you† write answer well to ye figure of *Lonchitis Maranthæ*, but the description, being much lower and having lesser leaves or pinnulæ, wch dit . . . . may yet be owing to the place.

5. The next are all save one the leaves of younger plants of my *Filix sax[atilis] caule tenui fragili*, or *Adiantum album Filicis folio* J.B. as I think.‡ The leaves of the elder roots that bear seed have their pinnulæ narrower & longer & somewhat thinner set, then these. The other leafe [*cum foliis Cicutarie divisura*] I take to be of a different species.

6. I perceive that being branched is but accidentall to this sort of *Trichomanes*, for in all this fair plant you sent me I find not one ramose leaf.§

7. I thank you for ye fair specimens of the *Muscus terrestris foliis retro reflexis* J.B.|| wch is the same I observed on the Alps, though I minded it not till advised by you.

8. The *Muscus Trichomanoides* &c. is a very pretty

\* A form of *Polystichum*.

† *Woodsia* sp.

‡ *Cystopteris*.

§ A form of *Asplenium Trichomanes* L.

|| *Lycopodium annotinum* L.

sort. But are the two patterns of ye same? they differ much in colour, &c.

9. The rush-grass intituled *Juncello accedens graminifolia* is aptly enough said to be *capitulis Armeria prolifera*. Of all ye Rush-grasses that I know the likest it, is that I take to be *Juncus parvus montanus cum parvis capit. latis* J.B.\* wch yet differs from it very much in having shorter stems for its bigness in proportion to its leaves, narrower heads and, as I remember, Rush-like leaves, and in being much bigger. But that grasse is common and I doubt not well known to you. That which I have in my *Hist.* described *Gr. junceum clavatum minimum s. Holosteum palustre repens foliis, capitulis & semin. Psyllii*† agree with it in having Grasse-leaves, & naked stalks with single-heads on yeir tops, but is in other respects different enough.

10. I am of opinion that this *Nasturtium petræum* is the same in specie with what you formerly sent notwithstanding the smoothnesse of the leaves, wch vary often according to ye age of a plant.

11. I agree with you in opinion that this is the *Lunaria vasculo sublongo intorto* before it puts forth its stalk.‡

12. Yr Snowdon Scurvygrasse is doubtless no other then *Cochlearia Batavica* or *vulgaris*, but I have not seen it so large on ye mountains.§

13. I know not what to think of ye Chamænerion, its leaves seem to be narrower, running in to a longer point & differently veined from the common: for full satisfaction it ought to be cultivated & observed in a garden.||

14. Of ye 2 sorts of *Cirsium* I acquiesce in yr judgement who have seen them growing.

15, 16. Of the 2 species of *Hieracium* I dare not pronounce any thing, as having never seen those kinds of Clusius growing. You are better able to judge of them,

\* *Scirpus cæspitosus* L.

† *Scirpus fluitans* L.

‡ *Draba incana* L.

§ Possibly *Cochlearia alpina* Sweet.

|| *Epilobium* sp.



yet following their descriptions & figures something I could object against yr opinion.

17, 18. The 2 *Thalictra*, unlesse otherwise different, I should take to agree in species notwithstanding ye diversity of their leaves.\* There is greater difference in ye leaves of *Pimpinella saxifraga ma. & min.* & *Petroselinum*, wch yet coming of ye same seed certainly are of ye same species.

19. The *Alsines myosotis facie* &c. is a fine plant, but in my method no *Lychnis* but a perfect *Alsine*.

20. The leaves of the *Bellis* seem differently indented from ye common *B. major*.

21. Yr *Sedum serratum flosculis compactis immaculatis* is a different kind from any I have seen.† The *Cotyledon hirsuta* I never found on ye Alps, yet took it to be *Sanicula Alpinae aliquatenus affinis* J.B. as you may see in my *Hist.* So you have all that I have to say concerning yr queries & plants sent, for wch I return you thanks, & shall [return] the plants again if you desire them. It is pittty but all the non-descripts or not figured were delineated, engraven & published in yr own name with their descriptions. I am now come as far as my paper will give leave: I have only room left to subscribe my self

Sr, Your faithfull friend and humble svt,  
JOHN RAY.

This Lr. was not sent so soon as dated.

91. MS. *Eng. Hist.*, c. 11, f. 49. Copy in Lhwyd's handwriting.

BLACK NOTLEY, Nov. 3, [16]89.

Sr,

I had not soe long deferred to return answer to your last of the 13th 8br but that I had little to write save to give you thanks for the draught you sent of ye *Subularia lacustris*, wch is a plant to me altogether

\* Forms of *Thalictrum minus* L. ?

† *Saxifraga nivalis* L.

new and unknown. I shall take care to get it engraven for ye ornament and advantage of my book, wch is not yet begun to be printed, but now Motte promises me speedily to set about it, & to get it out by Hilary Term. 2. for yr gift of your dried plants. I wish I had any thing by way of return to gratifie you withall, but truly I have but little of what is new or curious, or wch I can presume you want. I have made noe collections of Rock-plants, Cochlites, or other formed stones. Of plants I have some that I gathered in my travels beyond sea, any of which you may command. I have published a catalogue of them, out of wch if you please to collect & send me ye names of any you want or desire, if I have them they shall be sent. The dried plant enclosed in your letter is save ye bigness very like *Thlaspi vasculo sublongo intorto*.\* Before ye receipt of yours I had some notice from Dr. Robinson of an incredible stock of curious plants received from Holland by ye King & E.[arl] of Portland; & yt they exported next summer vast Cargo's from all parts. He also wrote me, yt Dr. Sloane had brought over with him a very great number of rare & new plants dried, from Jamayca & ye adjacent Islands; yt he shew'd him above an 100 new Ferns, & told him yt he had above as many more of that tribe, all non-descripts. If America affords such variety of all other sorts, there is noe end of Plants. Surely great is ye fertility of ye new World wch produces such a multitude of Species of ye same kind, & even in ye Northern parts of it plants of a greater stature & magnitude, yn our Europœans and congenerous to them. As to what you observe concerning ye mountains, I have long since remarked, yt ye mountains doe not only produce greater variety of species, but those too larger and more luxuriant, yn ye lower grounds: I doe not mean of ye same species, but of proper species to them under ye same genus, as for example, ye *Scabiosa centauroides*, a mountain-plant is larger yn any Scabious ye plain grounds afford.

\* *Draba incana* L.



Mr. Lawson of great Strickland in Westmorland not long since sent me a parcell of Trochites or Entrochi found in ye channel of a rivulet near him or rather in ye bank thereof, being washed out of ye clay w<sup>n</sup> ye water overflows ; they are of a clay colour on ye outside, & ye severall internodia (wch are short) are in some edged as sharp as a screw, in others flat : they are all taper, and some of ye bigness of my little finger, possibly they may not be unknown to you. I have no more to adde but that I am

Sr, Your very humble servant,

JOHN RAY.

93. MS. *Eng. Hist.*, c. 11, f. 44.

For Mr. EDWARD LLOYD at Mrs. Taylors in the Eagle & Child Alley in Shooe Lane, London.

[Forwarded] This ffor Mr. edward Llwyd att the museum in Oxford.

( $\frac{FE}{11}$ )

BLACK NOTLEY, Feb. 10, [16]89.

Sr,

Yrs of Jan. 19 came to hand, to wch I thought best to respit my answer till yr return to London, where I hope this will find you. On Wednesday next I intend to send you by Carrier a small parcell of dried plants, being such mentioned in your Catalogue as I could spare. They are not such fair samples nor so well conserved as I could wish ; but such as I have, whereof I intreat your favourable acceptance. Indeed the hast I was for the most part in would not permit me to extend and dry them better. I find one plant in ye Catalogue you sent wch I dare say is no stranger to you, that is *Melissa similis foliis minoribus glabris, flo. labello punctato* ; wch is no other then ye *Lamium arboreum Zanoni* or *Teucrium Tingitanum* of our London Herbarists ; wch yet you could not easily divine it to be unlesse you had consulted my *History*.

I have not yet heard or received any thing from

Mr. Sherard, nor doe you make any mention of him in your Letter. If he please to contribute any species to my *Synopsis*, it must speedily be done, for I believe the Book is already in the Presse: Dr. Robinson having written me a fortnight since that he had taken ye copy from Mr. Motte, & committed it to one Mr. Smith a Bookseller at the Princes Arms in Pauls Churchyard, & that I might expect two Ternios of it wrought off at the Presse next week. I wish you had had the oversight of the Copy before they began upon it, for there are many loose papers wch I fear will be misplaced, especially of those plants I recd from you.

Please to give my humble service to Dr. Plott, whose designed work I cannot but approve, & judge it will be very usefull & acceptable to ye ingenious, but I am of your opinion, that he will find but little encouragement from the Nobility as the times are at present. But if it please God to continue this King's life we have a fair prospect of better.

Mr. Cole is a Gentleman whom I am particularly obliged to, who hath been happy in making naturall discoveries. I hope he will ere long communicate them to ye publick. I am very incredulous of the stories of stones engendred in the clouds. They had need be well attested.

I have sent you in a paper enclosed in ye Parcell 3 varieties of *Entrochi*, but such as I suspect you may have already. If any thing should come to my hands wch I thought might be new or acceptable to you none should be more ready to communicate or in any thing else to gratifie you then

Sr, Your affectionate friend and humble svt,  
JOHN RAY.

94. MS. *Ashmole* 1817a, f. 213.

BLACK NOTLEY, March 28, [16]90.

Sr,

I received your Letter of Feb. 25th, but have been ever since so very ill by a violent cough & fever attendant



thereon that I have been in no condition to write. I am now, I thank God, better, but not perfectly free of either. I thank you for yr so kind acceptance of the small parcell of dried plants I sent you. I have most of the rest in your Catalogue, but only single branches, else you should have had them. Of formed stones, God granting a perfect recovery, I may heerafter trouble you for such sorts as I want & you can spare.

I received Mr. Boberts Letter & Catalogue of English plants, wch he makes to be only of his own discovery, not mentioning any contributions of Mr. Sherard. I have this day returned him an answer with some Animadversions & Queries. I expect every day Mr. Sherard, Dr. Plukenet\* & Mr. Doodyes† additions.

There are, I hear, seven sheets of my *Synopsis* already printed off, but they are not yet sent me. I fear by reason of my absence from the presse, & the multitude of loose papers, there will be some confusion, disorder & misplacing of species.

I perceive that at Oxford you are at some losse about ye *Muscus denticulatus major*, what manner of plant it is.‡ Therefore for your full resolution & satisfaction I have sent you part of that branch wch is only left me of that mosse wch grows on moist shady banks, creeping on the ground & striking fair roots into it. I am,

Sr, Your faithfull friend & servant,

JOHN RAY.

[The specimen is missing, but the thread with which it was stitched to the letter remains.]

In this illness Ray was treated by Dr. Benjamin Allen of Braintree, who has left a note on "Mr. Ray's Case of Peripneumonia, March 6, 1689-90, the symptoms of which were pain, heat at lungs, and difficulty of breathing and cough and feverish heat." Allen has recorded the treatment followed in his case-book, to which my friend Mr. Miller Christy drew my attention. It is

\* Dr. Leonard Plukenet of Westminster (1642-1706).

† Samuel Doody (1656-1706) Keeper of Chelsea Garden.

‡ *Selaginella selaginoides*. Lobel thought he had *S. helvetica* from Mendip (Druce).

also noted that Ray was in the 62 year of his age [*i.e.*, 1689], which is further evidence for 1627 having been the year of his birth.\*

MS. *Lister* 36, no. ii.

From EDWARD LHWYD to LISTER. Dated Oxford, April 10, 1690. [*Addressed*] For Dr. MARTIN LISTER, at the Old Pallace-yard near Westminster hall.

“ . . . I would gladly know how forward Mr. Ray’s Book may be, and when we may expect Dr. Plucknets Catalogue, and whether Dr. Sloan intends a History of Jamaica.

“I find Mr. Ray has been lately very ill, of a feaver and a violent cough, but I hope he’s now fully recoverd. . . .”

95. MS. *Eng Hist.*, c. 11, f. 45v.

For Mr. EDWARD LLOYD at the Museum in Oxford.

( $\frac{\text{MA}}{8}$ )

BLACK NOTLEY, May 7, [16]90.

Sr,

I recd yr very friendly Lr of Apr. 14th & doe hold my self much obliged to you for your kindnesse therein expressed. I doe at present (I thank God) enjoy indifferently good health, though not yet quite freed from ye dregs of my distemper. I hear now that my *Synopsis* is finished & come abroad, yet without any Errata, not because the book is void of faults, but because I could by no importunity obtain the sheets of ye Printer, that so I might draw them out. I am sensible that there are as well mistakes of mine as Typographicall errours, though not many of either, that I can find, very materiall. I thought to have put in two or three adviso’s concerning some of the plants you sent me, wch were either omitted, or but sleightly touched by me, but they were too nimble for me, & therefore I must begge your pardon.

I have from Mr. Sherard a Catalogue of other species observed by him besides those in Mr. Boberts’ paper. Yet being solicitous lest I should wrong Mr. Sherard by

\* Miller Christy, “More about Dr. B. Allen” in *The Essex Naturalist*, xvii.



attributing to Mr. Bobert alone all in that Paper to wch they both concurred, I wrote to Dr. Robinson about it, from whom I received answer, That Mr. Sherard told him, that he first found many of those plants wch Mr. Bobert sent, yet instanced in no particulars.

The snail you write off, received by Mr. Charleton\* from Surinam is very strange & remarkable. But how ye young Snayl hatch't of ye egges should come to be twice so big as ye eggs, I understand not.

As for formed stones I have no great variety, *Asteriæ* or stones with impressions of stars upon them (wch some distinguish from our Astroites, or Star-stones with five rayes) I have none. Of *Cornua ammonis* I have two or three varieties. I have also some resembling cockles & muscles, & Belemnites, & Brontiaë; but few different species, those I have were all gathered up in England, except one *Cornu Am.* with a spine & ribs found at Altdorf in Germany. I shall look over my stock, & give you a more particular acct shortly. I have great variety of Glossopetræ dug up in Malta, wch I perswade my self were originally no other than Sharks teeth. I have also plenty of *Oculi cati* found there & some snagged stones wch they call *baculi S. Pauli*, & others they call Cats heads. When I have reviewd them I shall send you a particular Catalogue† & such as you desire that I can spare shall be at your service. At present I shall give you no further trouble desiring the continuance of yr correspondence, & resting,

Sr, Your affectionate friend & servant,

JOHN RAY.

I have a Copy of my *Synopsis* at your service, if you please [to send] me word how it may be conveyed.‡

\* William Charleton *alias* Courten had a museum in ten rooms in Essex Court, Middle Temple. His specimens passed on into the Sloane collection.

† Lhwyd in a letter addressed from Oxford, July 1, 1690, addressed "For Dr. MARTIN LISTER, at the Old Pallace yard near Westminster hall," wrote: ". . . I understand Mr. Ray has some thoughts of writeing a *Synopsis Methodica* of ye Animals and Minerals of England."—(MS. *Lister* 36, no. iii.)

‡ ". . . Mr. Ray's *Synopsis* came out yesterday. On Monday morning I will send you a copy, that you may take it along with you . . ." —Dr. W. SHERARD to Dr. RICHARDSON, London, May 17, 1690.

97. MS. *Eng. Hist.*, c. 11, f. 46.

For Mr. EDWARD LLOYD at the Museum in Oxford.

B.N., July 7, [16]90.

Sr,

I thank you for yr Letter of July 1st, wch ye last Post brought me. I was much pleased with yr conjecture about the stones called Cats heads, & incline to your opinion. As for S. Paul's Bastons they seem to me as yet to differ from ye *Lapides Judaici*; whether the same with your Bristle-stones I may (as you say) be better able to judge upon the sight of them. The *Dentes & Ova serpentium* I know not whither to referre.

The Horns of the Narhual I have seen in many places, & some of a very great length, but that each Fish should have two of them I never read or heard before; & so am beholden to you for this relation. I doe readily assent to ye Danish Gentleman, that they all have so. I was formerly puzzled with Wormius his description of the manner of growing of this horn, as it were out of one nostrill or one side of the jaw, & not out of ye middle of ye snout, wch I thought absurd, & that he was mistaken or imposed upon: but this Account of yours clears the Case, so that we are again to seek for a Monoceros, wch we had thought we had found among fishes.

Reviewing my notes concerning Insects, & considering the things themselves, I find it a thing of infinite difficulty to draw up any tolerable Epitome of ye History of such as are found with us: They being almost innumerable. The two great heads or *Summa genera* that I would divide them into are 1, *Quæ nullam subeunt mutationem*. 2. *Quæ metamorphosin aliquam patiuntur*. The second genus I may divide either as they appear at their first hatching from ye egge, & so they will be either *Polypoda*, *Erucae*; or *Hexapoda*; or *Apoda*, *Eulæ*. Of the first sort come Butterflies, of the second Beetles; of the 3d Flies of all sorts, Bees &c. Or 2. as they appear after they have undergone their last change, & so they may be subdivided into *κωλεοπτέρη*, *Beetles* &c.,



or ἀνέλυστρα, wch are either *alis farinaceis*, *Papiliones*, or *alis membranaceis pellucidis*, & those either τετράπτερα, *Bees*, *Wasps*, *Hornets* &c. or δίπτερα *Flies*, *Gnats* &c. I am yet doubtfull about the processe of *Locustæ forficulæ* & *Cimices sylv.* wch though winged insects, yet I suspect undergoe no metamorphosis. Howbeit they are not at their first exclusion winged, but their wings grow out afterward. Can you give me any Account of ye Wood-seare or Cuckow spittle? doth not ye Animal latent therein come to be a *Cimex sylv.* I am doubtfull concerning Ants whether the flying may not be the males, the creeping the females, for they are found together in ye same hills. Neither am I yet fully satisfied concerning ye flying & creeping Glow-worms. Dr. Plot may if he please see Vintimiglia's relation of them in Columna's *Observatio Erucæ rutaceæ ejusq; Chrysalidis & Papilionis* at the end of his *Historiæ minus cognitarum stirpium pars altera*.

The number of *Erucæ* alone in this island is incredible, some plants having 3 or 4 sorts feeding upon them; & if we should make ye *Papiliones* a distinct genus from them, as all that write the History of Insects have done, we should double the number of species of that sort of Insect. The Beetle-tribe I hold to be no lesse numerous then they; & the Flyes perchance more. So that I know not but that the species of Insects may be equall to or exceed those of Plants.

If you please to send any thing to me, direct it as your Letters, & send by ye Braintree carrier, who innes at the Pewter pot in Leaden hall street & goes out of Town on Friday morning weekly. I rest,

Sr, Your affectionate friend & svt,

JOHN RAY.

98. MS. *Eng. Hist.*, c. 11, f. 43v.

For Mr. EDWARD LLOYD at the Museum in Oxford.

BLACK NOTLEY, Nov. 7, [16]90.

Sr,

I was in long expectation of an answer to my last:

but none coming I began to despair, & suspect my Letter might miscarry. At last when I thought of writing a second, the arrivall of your welcome Letter & present prevented me : of the receipt whereof I should have given you speedy advice but that I thought to have more carefully overlooked & examined each species of stones ; for at present I was not well at leisure, being employed in making some Additions to a little Book formerly published of Locall Words,\* & preparing it for a 2d edition. But the last Post but one bringing me a second Lr from you, I dared not deferre writing any longer, at least briefly to satisfy you of ye receipt of the box of Stones & return you thanks for them, but especially for your kind & affectionate expressions therein contained, wch were & must needs be highly pleasing & gratefull to me.

When I viewed the stones I could not but wonder there should be so many species found in so narrow a compasse, & yet you write yt you know not whether you may have found halfe ye variety by diligent inquisition discoverable in ye same space. All this Countrey affords nothing of that kind that ever I could heare of, save only ye *Ostracites anomalus majusculus admodum crassius*, (wch common people call Hobgoblins claws) & some Belemnites.

I have long fluctuated in my opinion concerning the Originall of these stones, whether they be shells of fishes petrified, or primary productions of nature in imitation of shels ; the Arguments for & agst both are so strong & pressing that they constrein me to settle in a middle opinion, that some are of one kind, some of another. Some of the Bodies you sent me, are to my apprehension real shels, having not only the figure, but also the consistence . . . & all the other accidents of shels. So that unlesse natu[re . . . only stones but shels too, they must needs have been [

\* *A Collection of English Words not generally used, with their significations and original, in two alphabetical catalogues, the one such as are proper to the northern, the other to the southern counties*, 1st edition, 1674, 2nd edition 1691.



es. Such are the *Pectinites amphictis latiuscule sulca* [  
*nites rotularis minor angusticlavius* to mention no mo[  
Whereas you desire a Catalogue of such fo[  
me. I can easily answer that request, [  
for I have none or next to none. For [  
made such collections, I contributed [  
serving any for my self, because I co[  
course to his. Since his death I have [  
voyages in quest of such things. Ye [  
not be long ere I send you an Account. Your question  
concerning ye signification of ye word *sear* I can give  
no satisfactory answer to. I fancy ye word *sear* might  
anciently signify froth, & so this *spuma* might be so  
called because it resembles ye froth that issues out of  
sappy wood when it is burnt. Otherwise *seare* wood in  
this Countrey signifies dry wood in opposition to green.  
Aldrovandus his *muséum* I did not take an exact survey  
of for want of time, but I dare say there is not there  
now the 4th part of the stones figured in his *Museum*  
*metallicum*. I never yet saw nor hope to see any repræ-  
sentations of Men, Women, Beasts, or Birds in marble  
or other stones. There may be casuall figures that by  
the help of Fancy may be imagined to be like land  
Animals. I may say of them as Cicero doth of Paniscus  
his head, wch Carneades feigned to be found in a stone  
cut asunder in ye quarries of Chios. *Credo aliquam non*  
*dissimilem figuram extitisse, sed certe non talem ut eam*  
*factam à Scopa diceret.*\* I have seen some of the  
famed figures of this kind in the Popish churches, but  
never saw any near resemblances of such persons, as  
were pretended. And for Father Kircher I account  
him a credulous person, possessed with ye vanity of  
most of ye Religious of his church who delight to tell  
strange & miraculous tales to amuse & delude ye vulgar.  
And truly what you wrote to me in a former letter of the  
exact figures of plants found in stones seems to me to  
savour of ye Romance, & I should be glad to see such  
resemblances. The *pietra imbuscata* of Imperatus, of

Letter  
torn.

\* Cicero *De divinatione*, i, 13.

wch they make Cabinets at Florence, I am well acquainted with & have by me. This at present. When I shall have carefully reviewed & considered each species of the stones you sent me you shall hear further from,

Sr, Your affectionate friend & svt,

JOHN RAY.

I am glad Dr. Plot is so well wedded. I hope & wish it may be to his lasting content. I am a little puzzled about ye *Gymnocrithon* or *Hordeum nudum*, whether it be not ye same wch at London they were wont to call *Triticum spica Hordei*: if so, it is improperly styled *Hordeum*, being a genuine *Triticum*. Dr. Plukenet also tells me that yr *Alsine myosotis lanuginosa Alpina grandiflora* is no other than my *Auricula muris pulchro flore alba* J.B. concerning wch I desire satisfaction from you.

MS. *Lister*, 36, no. vi.

From EDWARD LHWYD to LISTER. Dated Oxford, Nov. 27, 1690.

“ . . . Since my last, I have found . . . 5. Spondylites, vertebra lapidea, seu *Ichthyospondylos lapis*. They are allmost as big as ye Raiarum vertebræ which Mr. Ray mentions to be found at Malta, but of a different figure; I had found some very small vertebræ before, whereof I shewd you one at London: these have 2 holes in ye side, on one part; and two more on ye opposite. . . .

“I have heard nothing from Dr. Plot since I saw you. Mr. Ray writes to me that he’s prepareing his Book of local words for a 2d. edition. I suppose you have frequent conversation with Dr. Plucknet; if so, be pleasd to give him my humble respects, and acquaint him that I doubt not (at present), but ye *Alsine myosotis lanuginosa Alpina grandiflora* of Mr. R. *Synopsis* is different from ye *Auricula muris pulchro flore albo*, which (supposing this no error) I never found in Wales. The *Alsine* etc. is a much larger plant, very woolly, produces very membranaceous flowers in Aug. a long transpar. seedves. somewhat crooked, and I never found it but on ye top of ye highest mountain (at least so reputed) of the whole Island.”

EDW. LHWYD.



100. MS. *Eng. Hist.*, c. 11, f. 39.

For Mr. EDWARD LLOYD at the Museum in Oxford.

( $\frac{1A}{14}$ )

[Jan. 14, [16]90.]

Sr,

I have too long deferred to answer your last ; in excuse whereof I have to plead partly other businesse, but chiefly ye rigour of the season, wch renders writing somewhat grievous & uneasy to me : but yet though the weather still continues sharpe, I thought it better to write a few lines, then to forfeit your good opinion & hazard your displeasure by a longer delay.

I have again and something more carefully revised ye formed stones you were pleased to send me, but shall at present make no remarks upon them. Only tell you that I was much pleased with ye slate wch hath ye figures resembling ye leaves & branches of Plants upon it : for that I doe not remember ever to have seen the like. But as to ye conchites or petrified shels as they are called, if you can believe that those you mentioned were only mock-shels, then you elude the strongest argument to prove them to be sea-shells or Bones petrified, for then why might not the shels observed by Steno\* in beds of earth not stony at Volterra, & those observed by Mentzel† in a broken mountain near Bononia in Italy, cujus, saith he, in superiore parte multæ visuntur strages seriesue, ex testis conchyliorum marinorum omnis generis, plurima arena interjecta instar S.SS. Est enim inter hasce strages seriesue arena ad crassitiem ulnæ & ultra interpositæ. Erant a testæ conchyliorum variorum omnes ab invicem distinctæ, nec cuiquam lapidi impactæ, ad eo ut separatim omnia manibus tractari & dignosci potuerint. Interea vero diuturnitate temporis omnes istæ testæ erant in albissimam calcem facile resolubiles. But why should

\* Nicolaus Stensen or Steno b. Copenhagen 1638, author of *De solido*  
*Prodromus* 1669.

† Chr. Mentzel (1622–1701) *Lapis Bononiensis* 1675.

not these formed stones be found in the most high mountains as ye Alpes & Apennine, & Snowdon in Wales, &c. And why if they be original productions of nature, should she not (as you say) as well imitate the bones, horns & hoofs of land animals as shels & bones of sea. But I leave this argument. Such a Catalogue as you mention of British words would be very acceptable, & come time enough, for my book is not yet begun to be printed. This edition is augmented by near a 3d part, & yet no doubt there are many words still behind, wch an observant person living and conversing among ye Northern people might gather up. I agree with you that the Northern English borrowed those words yt are common to them with the Britains from ye Britains, not they from ye English. The very name of Cumberland argues that there were in those countreys store of that nation mingled with ye English, & its likely incorporated into one people. I shall adde no more at present but that I am

Sr, Your affectionate friend & svt,

JOHN RAY.

I must beg your pardon and excuse for my hasty scribbling and blurring occasioned by my minutely expecting the passing by of ye Post. I thank for the information given in your last, & pray the continuance of yr correspondence.

Endorsed by Lhwyd :

“Mr. Rays on ye mock Shells plants & severall curious particulars.”

102. MS. *Eng. Hist.*, c. 11, f. 47.

For Mr. EDWARD LLOYD at the Museum in Oxford.

B.N., April 6, 16[91].

Sr,

Yrs of March 13th conteining besides other particulars a Catalogue of British words parallel'd with



some English ones, wth the enclosed Catal. of Northern words communicated by Mr. Tomlinson, I recd about a week or 10 dayes since ; for wch I return you thanks. They came time enough to be printed, indeed to have been inserted in their proper places, had not ye copy been out of my hands ; for Mr. Motte hath not yet begun to print. There hath been obtained by ye Bookseller concerned, Mr. Wilkinson, a *Glossarium Northanhymbricum* from one Mr. Nicolson an ingenious minister living near Carlisle, who designs a History of ye Kingdome of Northumberland, to ye end of which he intends to adde a large Glossary of about 20 sheets, of wch this that is sent is but some words excerpted. It is written in Latine, & conteins many parallel words of ye Cymbrick, Gothick, Teutonick, Old Saxon & other languages. The word *Saim* or *Seam* is I believe a generall word all England over for grease or oil where-with they smear or anoint wooll to make it draw out the better into fine threads in spinning, wch heer the Clothiers call saiming of it. Your account of ye originall of it I cannot accept, because *Sebum* is a word proper to tallow or hard fat, & not used for grease, wch *saim* only signifies ; I rather think it to come originally from ye Hebrew *shamen pinguedo*. *Glaive* is a French word for a sword from ye Latine *Gladius*. I have not seen Dr. Bernards *Etymologicon Britannicum*, neither had I seen it were I able to passe any judgement of wt he asserts, having no skill in ye Welsh language. I doubt not but you are a more competent judge than he, & doe therefore incline to your sentence.

I have again reviewed ye stones you sent, & find upon examining & comparing them that they have not been inconsiderately named by you : indeed I see reason in most particulars to consent with you ; and were I disposed to doe it, could find very little to carp at or reprehend. That sort you inscribe *Siliquastrum* whither to referre I cannot certainly tell, but in my opinion, Dr. Lister is not much out in his conjecture. Only Natures not imitating any thing not covered with a

shell, or that is only fleshy, induces me to withhold my consent.

The name of Porpites is ill imposed, the stone seems to me to be an Echinites. The *Echinitis orbiculati laticlavii spicula seu radioli* seem not to differ from ye *Lapides Judaici Anglicani* of Dr. Plot save only in bignesse, & they are in my opinion well referred to ye *Lapis Judaicus* by ye Doctor. Howbeit what the *Lapis Judaicus* doth resemble is to me unknown. The radii of the *Echinus laticlavus maximus* I have sometimes seen but remember not, & therefore can passe no good judgement on them.

The *Conchites anomius* &c. of Dr. Lister seems to me rather of the Strombodes kind then ye bivalve. Give me leave to carp at ye writing of *Anomius* (wch is Columna's epithet), coming from ἀνόμιος it should rather be written *anomæus* in Latine.

The *Ostracites hemisphæricus* seems to me not to be well named: it being not deep enough to bear that denomination.

I believe ye authority I relied upon for ye finding of shels upon ye Alps was no better then what may be produced for Anchors having been found there. That there are none found upon ye Appennine, Columna is my Author, & for the stone found in ye calves stomach, I owe ye knowledge thereof to Mr. Ashmole.

Your design of publishing a Catalogue of formed stones I doe very much like & approve of. Only I would not have you confine your self to so narrow a compasse as ye neighbourhood of Oxford, but take in all of your knowledge that are found in England. I know no man so fit for such an undertaking as your self. You must promise a generall discourse about ye Originall of those stones. I am not able to suggest to you a better method for ye disposing of them, then will safely occurre to your own thoughts upon consideration, you having so comprehensive a knowledg of them. The best way therefore is first to draw up a method your self, without suffering your fancy to be biassed



or inclined by another mans thoughts ; & then I may send you mine.

I have nothing to answer to ye Danish gentleman's quærie, but that I never heard or read of any flowers or seeds that our Glovers make a perfume of for gloves : nor can I get any information from my learned friend Dr. Robinson whom I intreated to enquire concerning it at London. He writes me that they make use of several sorts of Aromatic oils, powders, essences, and whites of eggs, but that ye generall perfume is oleum Rhodii rub'd in, afterward, glac'd over with ol. Amygdal. dulc. recent. or album ovorum.

This at present from,

Sr, Your very affectionate friend & svt,

JOHN RAY.

104. MS. *Eng. Hist.*, c. 11, f. 48.

Mr. EDWARD LLOYD at the Museum in Oxford.

( $\frac{MA}{28}$ )

BLACK NOTLEY, May 27, [16]91.

Sr,

Your Letters being not sterile & empty papers, but pregnant wth good matter, cannot but be very grateful & welcome to me. Such correspondents give me subject to say truly, with Solon I think it was, Γηρασκω δ'αίει πολλά διδασκόμενος.

I am glad to have discovered so probably what yr *Siliquastrum* is an imitation of. I doubt indeed whether there are any bodies imitated by nature then ye shels or bones of fishes, if indeed stones so formed be original productions in imitation of shells & bones. You shall have my objections against this opinion, when you shall be in some forwardnesse with your work ; wch I still persist to advise & desire you to make general of all England. Though you are confined to Oxford, yet not so, I see, but you can make excursions a good way off, & by your friends you may procure a good number of

such species as easily occurre in all the celebrated places.

I had no reason to suppose ye Porpites to be an Echinite but its figure, I have no microscope to view & examine it by. Indeed it hath nothing of those five radii wch are observed in all Echinites.

The stone you describe may probably be an imitation of ye mandible of some fish, but unknown to me. Indeed I cannot pretend to any skill in ye osteology of fishes: I dare say there is scarce any man can make a more likely conjecture then you have done.

I thank you for ye Account of your journey. It hath been observed by our Antiquaries that in most places ending in chester there have been ancient Romane coyns & medals found; so that chester seems to be derived from *Castra*, & that such places were Romane garrisons or camps. The like chequer'd pavemt to wt you mention I my self have also seen in other places; doubtlesse they were Romane works. I doubt whether Mr. Cole be qualified with abilities & skill sufficient to write well about equivocal generation: & for his MS. of naturall things . . . doe well to get it perused by some good naturallists, who are . . . & know what is already described & published. I never saw Dr. B[urnet] *Theory of ye Earth*, but by wt I have heard of it I think it needs no great confutation.

The books that have been written concerning the monumt called Stonehenge, & a double view of ye thing, serve rather to unsettle then establish me in any opinion concerning it. I should with Inigo Jones firmly believe it to have been a Romane work, but that methinks it is too rude & impolished for their Architects; & for that I have not seen or heard of any ancient temple or other building of theirs in Italy or elsewhere like it.

Those figures of Plants naturally impressed upon Slate I account a great curiosity, wherewith I was first acquainted by you.



I have now a querie to make, that is, what plant Dr. Plot meanes by *Lagopus major vulgaris* Park.\* in his history of Oxfordshire.

I know not whether I have mentioned to you a small Tract wch I have drawn up concerning The Wisdome of God manifested in ye Works of the Creation †: whereof I intend you a copy. I hear ye book is come abroad, & hope you will receive it this week, if my Bookseller fails not in his direction.

I am Sr,

Yours in all offices of love & service,

Jo. RAY.

106. MS. *Eng. Hist.*, c. 11, f. 49.

[Copy.]

For Mr. EDW. LLOYD at ye Museum in Oxford.

BLACK NOTLEY, Aug. 17, [16]91.

Sr,

Should I pretend multiplicity of businesse to have been the reason of this slackness in corresponding with you, perhaps I might obtain an easy belief; but because I have observ'd this to be ye common excuse of those yt have little to doe, and time enough to spare, I shall rather cast it upon my sloathfullnesse, & partly also want of subject for a letter.

I shall say nothing concerning ye main qestion viz. ye origin of ye form'd stones. But your conjecture concerning ye cornua Ammonis I allow to be probable, yet me thinks it is more likely they should be imitations of ye skeletons of serpents, & so well denominated by ye vulgar serpent stones, both because they imitate serpents in their convolution & in their length & slender-nesse at least some of ym & because I have observed some species yt have a spine with a forrow on each side; wherein they correspond with no fish: & likewise perfect ribs I mean imitations of ym. Yr reason

\* *Trifolium arvense* L.

† A notice of this work appeared in *Phil. Trans.*, xvii, p. 611.

taken from their breaking into joynts resembling ye Vertebrs of Animals is valid & conclusive in my opinion ; & I agree with you yt ye Maltese Catsheds are probably such Vertebres.

I am glad you have entertaind some thoughts of enlargeing yr Design & taken all England into your field. Tis pittty you should want encouragement. I wish I could any way give you assistance by procuring promoters. But truly there are not in our neighbourhood any of ye Gentry or Clergy yt minde any thing of Natural History or ingenious Literature ; and I have little familiarity with ye Gentry elsewhere. Tho I am one yt condemn *periautologie*, yet to fill up my letter because I can find nothing else, I hope you will pardon me, if I tell you wt I am doing. My *Synopsis meth. Stirpium* &c. I am revising & enlargeing with ye addition of many species. I have this spring been diligent in ye inquisition of Mosses, whereof I have observed & distinguished above forty new sorts,\* all as truly & certainly distinguishable by characteristic notes, as any other greater plants. Mr. Dale a neighbour brought me a sort of *Alga graminea seminifera*. The upper leaves are hollow or fistulose, not round like onion leaves ; but on ye upper side riseing up into a ridge : in this hollow is contained another leaf springing from ye same joint, to which enclosed leaf grow two rows of folliculi, every one conteining a single seed : when ye seed is ripe ye ridg of ye 1st or conteining leaf

\* “. . . . Mr. Rays Diligence and ingenuity is beyond Comparison : he has lately discovered 40 new mosses in his own neighbourhood ; which (considering ye age we live in) must needs argue a wonderfull sagacity.”—LHWYD to “Dr. MARTIN LISTER, at the Old Pallace yard, Westminster.” Oxford, Aug. 25, 1691. MS. *Lister* 36, no. xii.

“. . . . Mr. Ray has lately discovered about forty new mosses in his own neighbourhood ; and he tells me Mr. Dale has found out an *Alga graminea seminifera* [*Zostera marina*], bearing seeds in the middle of the two leaves. These seeds are shining, solid seeds, like those of land plants. He has in the presse a very curious discourse about the dissolution of the world. If your neighbourhood affords any form'd stones, I beg that you would please to communicate some of them ; for I have been persuaded by Dr. Lister and Mr. Ray to put into some order what observations I have made in that kinde. . . .”—LHWYD to RICHARDSON, Oxford, December 3, 1691.



slits or opens, ye several husks also growing in ye inclosed leaf open & cast out ye seed, wch is oblong, rib'd & like ye seed of a land plant. And because my last Tract has found some acceptance, I am at ye instance of my Bookseller reviseing & prepareing for ye Presse a short Discourse concerning ye Dissolution of ye World. I have been this Summer & am also still busy in ge[tting] of ye Insects of this countrey, & find ym so numerous yt seavn years will not suffice to search out and give any tolerable acct of ym. I wish I had some such assistants as yr self, who can with diligence prosecute any enquiry. For I know yt in other parts of England there are many species as well of Insects as of Plants not to be found here. I am,

Sr, Yr affectionate frd & servt,

JOHN RAY.

This letter is endorsed.

“August ye 17 1691. A copy of Mr. Ray's Lettr to Mr. Lhoyd on a policy common to idle persons; & on ye serpens stons & a fine fucu[s] found by Mr. Dale & on Insects & other wonders in nature.”

**109.** MS. *Ashmole*, 1817a, f. 214.

For Mr. EDWARD LLOYD at the Museum in Oxford.

( $\frac{\text{NO}}{26}$ )

B.N., 9br. 25, [16]91.

Sr,

Yours of Novemb. 10th not sent so soon as dated, came to hand, & spent not much time by ye way; for I recd it ye 16th. Mr. Jo. Aubrey gave me notice of ye robbing of ye Museum,\* wch I was sorry for as well for the losse of those rarities, as ye trouble & disturbance I know it must needs give you.

\* Lhwyd had barely succeeded Plot as Keeper of the Ashmolean Museum for more than a year, when the Museum was robbed. The collections, however, suffered less from theft than from the apathy of some of the later keepers. Marat has been suspected of the crime.

The Discourse concerning ye Dissolution of the World is finished & under ye Presse,\* so that I hope shortly to present you with the thing it self, wch might supersede any account of ye contents of it ; but yet because I have little else to communicate, I shall observe yr comands. The Body or Skeleton of it is a sermon I preach't above 30 years agoe at S. Maries church in Cambridge upon 2 Pet. 3. 11. The heads of ye Discourse are 1. The Testimonies of Scripture concerning the Dissolution of ye World. 2. The Testimonies of ye ancient Christian Writers. 3. The Testim. of the Ancient Heathen Philosophers & Sages. 4. An answer to the following Questions.

1. Whether there be any thing in nature that might prove & demonstrate, or argue & inferre a future dissolution of ye World ; & heer I mention & handle four probable or possible means of such a dissolution. 1. The possibility of the waters returning again to cover ye earth. 2. The possibility of ye extinction of the sun. 3. The possibility of ye eruption of ye centrall fire. 4. The possibility of a deflagration in ye torrid Zone.

2. Whether this Dissolution shall be effected by natural or by extraordinary means, & what they shall be.

3. Whether shall ye Dissolution be gradual or suddain.

4. Whether shall there be any signs or forerunners of it.

5. At what period of time shall ye World be dissolved.

6. How far shall ye Conflagration extend : whether to ye Etherial Heavens with all ye host of them : Sun, Moon & Stars ; or to ye Aereal only.

7. Whether shall ye Heaven & ye Earth be wholly dissipated & destroyed, or only refined & purified.

Besides, there are two large Digressions, one concerning ye general Deluge in the days of Noah : another

\* *Miscellaneous Discourses concerning the Dissolution and Changes of the World*, London, 1692. See *Phil. Trans.*, xvii, p. 615.



concerning ye Primitive chaos & creation of ye World. In the former of those at ye instance & importunity of some friends I have inserted something concerning formed stones as an effect of the Deluge, I mean their Dispersion all over the Earth. Therefore you will find all I have to say in opposition to their opinion, who hold them to be primitive productions of Nature in imitation of shels. I intended to have reserved them for your work, but they extorted them from me, upon pretence that my Discourse would be imperfect without them; & that no man who hath written heertofore concerning ye Deluge hath made any mention of them; & therefore such an addition, for ye novity of ye matter would be acceptable to ye curious, & give my book advantage of sale.

Your Discoveries in ye subject of formed stones are very remarkable & instructive. Methinks what you have now found out should a little stagger & unsettle you in ye opinion & belief that they are original productions in imitation of the shels & bones of fishes. I will not suggest what I know must needs occurre to your thoughts upon contemplation of ye fossile oysters you discovered. I never heard of any parts of crustaceous fishes found in England among other fossile shels. I have seen in *Museums* beyond sea the entire fishes petrified.

All ye knowledge I have of Mr. Woodward is from your letters. In a former letter I remember you told me that Mr. Beaumont had written agst Mr. Burnet's theory of the Earth wch he intended to print. I doe not yet hear that it is come abroad, I pray tell me in your next, whether you have any further news of that work. Were I in a capacity of seeing Mr. Bobert's Collection of Insects, they might be very usefull to me, but I doe not see how I can come to a sight of them, without making a journey on purpose; wch my circumstances will hardly permit me to doe. By descriptions I doubt we shall scarce come to a right understanding of one another. My Collection of Local

Words is published, as you may learn by the *Gazette*. But the Bookseller concerned in that copy is so stingy & sordid, as not to allow me copies to present my friends. I will not further urge your composing a generale Catalogue of all formed stones you have discovered in England: doe as seems best to you. The Post calls for my Letter, & will allow me time to write no more than that I am,

Sr, Your affectionate friend & servant,

JOHN RAY.

110. MS. *Ashmole*, 1817a, f. 216.

For Mr. EDWARD LLOYD at the Museum in Oxford.



(1A)  
(21)

BLACK NOTLEY, Jan. 18, [16]91.

Sr,

I had sooner returned answer to yr last of 10br 20th but that I waited ye finishing of my Discourse concerning the Dissolution of the World, whereof I intended you a Copy, that I might send you an Acct. of it. Wednesday last I had advice from Mr. Smith, that ye Printer Mr. Motte had promised him perfect books of it as that day or the next. If he was so good as his word (as he seldome is) you may expect a Copy of it the next week or ye following.

You are not much out in your conjecture concerning what Dr. Plot wrote to me. He is a Gentleman personally unknown to me. You have been so long acquainted with him that you must needs thoroughly understand his nature & manners. The opinion I have of your judgmt & Charity will not permit me to think you have done him any wrong in ye Character you gave of him: yet I am sorry that he deserves no better. I fear also he may be too much influenced by worldly advantages of honour & profit, for I have



been told that he was inclinable to change his Religion in the Reign of ye late King James.

I should be very glad to see such of Mr. Bobert's Insects as he accounts most rare, (though perchance such as be common with you may be rare heer) but I fear they cannot be so fixt & put up but they must receive some damage in carrying and recarrying by the jolting of ye Wagon. You will highly oblige me by such a Collection as you offer to make next Summer, if God grant us both life & health. A person of that capacity & industry, & acquainted with such reserches & Observations, must needs in a Summers time make a considerable progresse in the History of ye Insects of ye Countrey he lives & converses in.

The Holywell mosse I confesse to be sweet-sented. I can also affirm it upon my own experience ; nevertheless I am far from believing that it is miraculous. Possibly it may be a peculiar sort of Mosse wch is naturally sweet-sented, not only there but where-ever it grows. When I was there I was not curious in distinguishing the species of Mosses. But this I believe you can resolve. But if it be specifically the same with any common kind of Mosse, yet may it accidentally or from ye nature of the place partake such [a] sent. So the common *Rosa canina* is some times found sweet-sented though for ye most part it be inodorous. I my self have now & then passing by hedges full of such plants discovered one or two by the sweet odour where-with they have perfumed the air, & affected my nose, though I be none of ye most sagacious but I can but only conjecture about it ; & leave it to further Observation & enquiry.

The story of ye Ear of Rye taken out of ye side of an Infant I can hardly prevail with my self to believe. If you had seen it yr self, or if I had so good an opinion of ye veracity of ye first Reporter as I have of yours, or you have of his, I should not doubt it. I cannot conceive any possible way of its getting in there ; or springing & growing there from ye seed : & without

seed I cannot admit any production, no not so much as of a Vegetable, possible without a miracle : unless we will grant, that ye familiars of Witches or other evil Spirits, may convey such things into the vessels or muscles of Men or other Animals by some slights & secret ways.

I am glad you now consent to follow my first advice in yr intended Catalogue of formed stones, to take in all ye English formed stones hitherto discovered. So I have return'd something in answer to the severall particulars in yr Lr that required it, & shall adde no more but that I am,

Sr, Your affectionate friend & svt,

JOHN RAY.

112. MS. *Ashmole*, 1817*a*, f. 217.

For Mr. EDWARD LLOYD at the Museum in Oxford.

(<sup>AP</sup>  
5)

BLACK NOTLEY, April 5, [16]92.

Sr,

I recd yrs of Febr. 29 for wch I thank you. Your Letters are so ful fraught with matter, & cost you so much time & pains, that you need not write many of them. Your Observations concerning ye Mountains in Wales are very notable. I shall by your leave make use of them in a second edition of the Discourse concerning the Dissolution of ye World, wch Mr. Smith designs to publish when this is off his hands ; wch may perchance stick longer then he imagines.

The second Edition of my Discourse of ye Wisdome of God &c. with large additions is almost finished, & ready to come abroad. I have no Copies of it for my self, & so cannot present my friends with any : wch I am sorry for.

I cannot but take it very kindly from Mr. Bobert, that he is so willing to let me have the view & use of



his Collection of Insects. I owe it to your interest in him. They might be indeed sent from Oxford to London without harm by boat; but there being no way to convey them hither but by waggon, I fear they must needs suffer by the shaking & jolting there; & so think not best to venture them, & to destroy or marre in a days time what hath been gathered together by many years pains & diligence.

I am not able to give you any directions, nor put you in a better way or Method for collecting of Insects, then you will easily invent your self. I may suggest to you that I have observed all Diurnal Butterflies to have *Antennas clavatas*, & excepting two species to sit *alis erectis*: & that they are but few in respect of the nocturnal ones or *Phalænæ*, I haveing observed of those not above 30 kinds, but of these two hundred. *Goedartius* might be usefull to you, but especially Swammerdam's *History of Insects*, wch is certainly ye best book that ever was written upon that subject. I was lately enquired of by a certain *virtuoso*, whether I had observed the *Ricini* & *Reduviæ* to be imperforate as *Mouffet* affirms, but could not return him any other then a negative, having never examined them. It may be you may be able to confute *Mouffet* by experience; for I conjecture him to be mistaken.

The Relation of the Toad I cannot deny, being attested by so credible an Ey-witnesse & curious observer as Dr. Richardson. Yet can I not be perswaded that that Animal was at first spontaneously generated there, or that so soft a creature could possibly make it self a hole in so hard a stone; but that when it first crept in there ye stone was soft & yielding, & afterwards hardened about it; & doubtlesse some air must some way or other insinuate it self into ye stone for its respiration.

I am now by my Taskmasters put upon another work, that is a *Synopsis Animalium Britannicorum sanguineorum* to be put out by it self,\* The Synopsis

\* A work of 344 pages published in 1693.

of Insects being a Work of time, & they not willing to stay for ye other so long.

Excuse my confusion & scribbling, & impute it to ye boldnesse I take upon presumption of yr good nature, & esteem me,

Sr, Your very affectionate friend & servant,

JOHN RAY.

117. MS. *Ashmole*, 1817a, f. 218.

For Mr. EDWARD LLOYD at the Museum in Oxford.



(1Y)

BLACK NOTLEY, July 18, [16]92.

Sr,

I thank you for yr last of June 24th. Your Collection of Insects I doubt not but will be very usefull to me in my intended *Synopsis of Exanguious British Animals*,\* & doe therefore pray you would continue to collect so long as the season lasts. I find the species of all kinds, but especially Papilios, wch I have with most application prosecuted, to be exceeding numerous, & doe despair of ever coming to an end of them.

A Neighbour & friend of mine one Mr. Allen,† Physitian in Braintree, hath found heerabout the flying Glow-worm in plenty, though it doth not shine: it is a sheath-winged insect of the Beetle kind; wch he accidentally discovered: for observing the abdomen of it not to be made like other Beetles but flattish & with imbricated scales like that of a shining Glow-worm; he put it into a box wherein he had reserved some shining Glow-worms (I meane the common creeping ones) whereupon it presently coupled with one of them. Wch experimt communicating to me, I was very glad to find Vintimiglia's

\* Never published.

† Miller Christy, *Dr. Benjamin Allen (1663-1738): a forgotten Essex Naturalist*, *Essex Naturalist*, xvi, p. 146 and xvii, p. 1.



observation mentioned by Columna (wch Dr. Plot could not find, & therefore lest you also should be at a losse in seeking for it, I shall tell you is in ye 89 page of his *Pars alter Stirpium rariorum & minus cognitarum*;) confirmed. But because Mr. Waller doth affirm that the flying Glow-worms are of both sexes, he himself observing them to couple together; to salve & reconcile this seeming contradictions Dr. Plot supposes that the flying Glow-worm wch Vintimiglia put in among the creeping ones, & saw coupling with several of them, was not an Animal of the same kind but of a different, wch being prurient & finding females of another species mingled with them, as horses will doe with Asses, for want of those of their own. To refute wch salvo, as much as might be, Mr. Allen put severall creeping Glow-worms into an open box, & among them a flying one, wch fluttering with his wings as if he intended to fly away, and as Mr. Allen expected he would, instead thereof presently applied himself to one of ye creeping ones & coupled with it. But how then shall we bring of Mr. Waller? I know no other way but by supposing that there are two sorts of flying Glow-worms, the one whereof hath both sexes flying, the other is the male of the creeping Glow-worm. For Animals not pamper'd by man, & at their liberty, if they can find any of their own species will never couple with a strange one.

Mr. Dale hath observed a small sort of *Tinea vestivora*, wch forms himself a case, like ye Phryganea or straw-worms in water, wch he carries about with him putting forth his head & legs, wch upon occasion he can withdraw into ye case. This I suspect changes into a beetle, not into a Phalæna as the common *Eruca vestivora* doth. My Synopsis of Animals I carry on as fast as I can: but find more difficulty in it then I at first expected, else I think I should not have attempted it, for I undertook it only to gratify my Bookseller & some friends. I was doubtful whether the *Merula torquata* & *saxatilis* were two distinct species, that we call the *saxatilis* being only the female of the *torquata*, for

ye female *Torquata* wants that white ring the male hath. I am now inclineable to think them different. It may be you can fully settle & resolve me.

It's a strange story & hardly credible you relate of ye Puffin that fell into ye hole of ye Fishpond at Hartwell ; but what sort of Puffin ? was it our Manks Puffin, or ye *Anas Arctica* Clus. called in some places by that name.

I never heard or read of any different species of Otters, & therefore that Relation wants confirmation.

Carry on with vigour your History of formed stones & all Fossils in general as opportunity & ability will serve, as also the whole History of Plants and Animals, wherein you have an excellent gift, & have been so successefully employed ; & by communicating them your self to ye World reap the honour of your own Discoveries & Observations. I must to your just commendation acknowledg to you in all the entercourse I have had with you that I have discovered lesse of affectednesse, conceitednesse, pride or vain-glory then in almost any man of my acquaintance. This is all I have to say at present & perhaps I have said more than your modesty can well beare, however I have given you my true sence ; & I have no reason to flatter, unlesse to extort reciprocall commendations from you, which I am conscious to myself is no motive to me. I am,

Sr, Your affectionate friend & svt,

JOHN RAY.

120. MS. *Ashmole*, 1817a, f. 219.

BLACK NOTLEY, Novemb. 7, [16]92.

Sr,

It is now time I write something in answer to yrs of 8br. 7th last past. I have now finished my *Synopsis of Animals*, of wch I have formerly given an Account. I incline to think that the *Merula saxatilis* may be specifically different from the *Merula torquata*, though they are very like & both haunt ye same places. I have not yet put the Copy of this Treatise out of my hands, nor shall till I hear that my Bookseller hath procured



paper for it. While it lyes by me I can either adde or amend accordingly as matter & occasion offers it self. In some of Mr. Aubrey's writings wch I have had a sight of I find some Authority's to prove that Bevers\* were anciently native of England being found wild heer ; & afterwards the race of them quite destroyed & extirpated, as Wolves also were.

You communicate in this Letter many remarkable discoveries of Petrifications, especially that of the fragmts of Fish-jaws having their teeth placed in their natural order as they are in ye Fish, wch is a further strong argumt that these bodies were anciently ye parts of Fishes.

I see you are now, & not without good reason, come over to their opinion, who hold the *Cornua Ammonis* to be of ye Nautilus kind, but if Sgr Boccone† be ye first author of that opinion then he hath published something more ancient then what I have seen of his. I took Dr. Hook to have been the first Observer or inventor, & broacher of it in his *Micrographia*.

One thing I have long intended but still forgotten to consult you concerning. An old friend of mine, one Mr. Williams, who was sometimes Schoolmaster at Beaumaris & Chaplain to my Lord Bulkley, told me that they had a sort of Currant-tree in North Wales, wch they called Arbour-wood, wch he knew not what to make of, wch I fancied might be the *Ribes Alpinus dulcis* of ye Bauhines. I pray communicate to me if you know any thing of it. The Collection you have made of

\* Here Lhwyd has added the following marginal notes :

“ See Giraldus Cambrensis *in itin. Cambriæ* cap. v, l. 2, c. 3.

“ L. G. apud G. Davies quando vixit ?

“ Fiber Brit. Addanc et Afanc.

“ A kind of a yellow insect which gives notice to ye Saltpeter men in digging that they are come to plenty of nitre. Mr. Aubrey.”

† Note in Lhwyd's handwriting : “ This was my mistake, for I find Sgr. Boccone's letter dated Amsterd. 1674. whereas Mr. Hook's *Micrographia* was printed Ao. 1665. But Olaus Wormius in his *Museum* p. 86, haveing given a figure & description of one of these *Cornua Hammonis*, by ye name of *Lapis Sceleton serpentis referens* adds *Figura et circumvolutionibus magis Nautilum quam serpentum mihi refferre videtur*.

Museum Wormianum &c. adornata ab

Olao Wormio M.D. Amst. 1655.”

Insects please to send by the next opportunity, directing them to my Bookseller Mr. Smith, who will take care to convey them hither.

I hope it will not now be long before I have small present for you, the second Edition of my *Discourses concerning the Chaos, Deluge & Dissolution of ye World*. Some of my friends & acquaintance\* at London would fain put another task upon me, that is, revising & making notes upon Rauwolfius his *Itinerary*, wch they have gotten translated into English by the chymical operator to the Company of ye Apothecaries. But I am not inclinable to undertake any Work of that Nature. That I have hitherto spell'd your name as I have done, was not because that I thought you understood not the Orthography of your own name much better then I, but to comply with the English manner of writing & pronouncing it. I presume Mr. Aubrey is by this time returned to London, though I have not as yet received any notice thereof from him. I am,

Sr, Your affectionate friend & servant,

JOHN RAY.

**123.** MS. *Ashmole* 1817a, f. 220.

For Mr. EDWARD LHWYD at Jesus College in Oxford.



(DE)  
29

B.N., December 28, [16]92.

Sr,

That very day that your Lr came to hand, the Box of Insects was also brought me, so that you were not out in yr conjecture. The several insects were so well fixt, that, to my admiration, there was not one of them stirred by ye shaking & jolting of the wagon, but came as entire as they were sent out. I wish I may have as good success in remitting them. Upon opening of the

\* Messrs. Hatton, Sloane & Robinson. See *Corr.*, p. 255.



box I was mightily taken, I might say enravished, with the beauty of the spectacle, such a multitude of rare creatures, & so curiously conserved. Truly the ingenuity & industry of ye Collector Mr. Bobert is highly to be commended, & he encouraged to proceed. By the view of this Collection I am satisfied, that there are but few of the Diurnal Papilio's in other parts of England, wch are not to be found heerabout (I know not what variety the mountainous parts may afford) for in this Box I find but onely one species unknown to me: but of the nocturnall or Phalænæ many. I perceive he hath not descended to ye small *Phalænæ*, wch are exceeding numerous, & may exercise him heerafter.

You have given so good Authority for the Bevers being native of England that I think we need not doubt to put him amongst our British Animals. That a Bear should be likewise one of them, I confesse is news to me: yet you make it probable.

Rauwolfius is an author of good account among the learned. Clusius & both ye Bauhines mention him always not without great respect. No more then the translation of the first part of his *Itinerary* is as yet sent me, wch I have perused, & well approve of; he seems to me, to have been very diligent in observing, & faithful in setting down his Observations.

The West India Voyage you mention is, I know, very agreeable to a person of your Genius & curiosity, & I know no man so well qualified for such an undertaking both for skill & industry, but it is so hazardous both for the danger of the Sea, & at this time of ye publike enemy, & the great change of air and diet, that I am with Dr. Lister rather inclined to dissuade you from it. Dr. Moulins & poor Tom Willisell's losses, wch I cannot remember without some trouble, are objections against your going. So I shall not think upon any queries for you, though indeed I have not time at present, thinking it necessary for your & Mr. Bobert's satisfaction to give you advice of the receipt of the box & in wt condition I received [it] speedily.

I ordered my Bookseller to send you a copy of the 2d edition of my *Physico-theological Discourses*, for now I so intitle them, wch I hope is come to your hands. I rest,

Sr, Your affectionate friend & servant,  
JOHN RAY.

125. MS. *Ashmole* 1817a, f. 221.

B.N., March 22, [16]92.

Sr,

I recd yrs of Feb. 21, for wch I thank you. I must be but brief in my Answer, for I have been this Winter so afflicted with exulcerated Pernio's upon ye backside of the small of both my legs, occasioned at first by inadvertency & neglect, (for they might have been prevented or at first easily healed) that writing, or indeed any other businesse is become troublesome & uneasy to me. You would not imagine, that ulcers of wch so little acct is made should be so painful & vexatious, they giving me very little respite from pain night or day.

I thought to have before now fully examined Mr. Bobert's Insects & compared all wth mine, that so I might return ye box so soon as ye ways come to be good. But this grief, & other businesse my London friends put upon me have set me backward. The diurnal Butterfly (I call all those & only those diurnal that have *Antennas clavatas*) new to me is the last, or that next to ye back of the box, in the first row of diurnal ones; it is not marked with any figure, but next to that marked 13. I have entituled it *Papilio major, alis pullis, exterioribus duplici macula lutea cum oculo in utraque nigro variis*. It is somewhat lesse than ye most common Butterfly wch I call *urticaria*. If this be not sufficient to lead him into ye knowledge of it, I shall in my next send him a more full & particular description.

By ye fate of Dr. Moulins & T. Willisell I meant no more then their deaths in the voyage to ye West Indies,



or there, by the great change of Air & Diet. Had God granted them life & health, they would have made great discoveries, & highly improved natural History. Very few species would have escaped their notice; especially T. Willisell, who was indefatigable, & could endure any hardship, & live as well upon Oatcake & whig as another man upon flesh & wine, & ramble over hills & mountains & woods & plains.

In my intended *Synopsis of Insects* I intend, as in that of plants, short descriptions of each species, wch is no more then needs, else my *Synopsis* will signify little. And yet notwithstanding the best & most characteristick notes I can invent or give, the species are so numerous, yt it will be very hard to know them by verbal descriptions without figures. Crustaceous & Testaceous Animals I intend not to admit, these last having been already published by Dr. Lister. The division of such exanguious Animals from ye figure of their shells is most Philosophical, but in regard of ye vast number of species the division according to place I hold to be most usefull & advantageous for a learner.

You have been very curious & diligent in observing so many *stellæ marinæ*. Your 3d & 4th kinds or *St. vulgari* congener *purpurascens minor*, & *St. marina echinat.* of Rondel. I have not taken notice of, but one or two I have met with wch you mention not. Your observations concerning the manner of their incessus are curious & notable. The figures added to my Book taken out of *Agostino Scilla* were chosen by Dr. Robinson. And truly Scilla's book I never saw, but recd this acct of it from ye Doctor. Agostino Scilla hath long dissertations on his draughts, but his pencill is much finer than his pen. He is a very curious & ingenious painter, but no accurate Naturallist. He borrows most from Columna & Steno, but his figures are originals very large, many & excellent. I found ye book accidentally amongst Mr. Charleton's rubbish, who has now placed it in his cabinet, from whence Mr. Lloyd may safely command it.

I perceive now by yr more exact description of it, I was deceived in Mr. Doody's stone by the relation & acct thereof they sent to me.

Mr. Aubrey's *Adversaria physica* are miscellaneous observations under the severall heads of Nat. Philosophy, as earths, stones, minerals, metals, Fountains, metiors, &c. received from several learned men and others either by word of mouth or letter, & may make a book of above 20 sheets. There are a great many good observations & Relations, in it, wch its pittty they should be lost. Indeed what else I have seen of his writing, is both pleasant & instructive to read.

I have but a word or two more concerning myself & shall then make an End. My *Synopsis of Quadrupeds &c.* is now under presse, there are as yet but seven sheets printed off, the Printers proceeding slowly by reason of Mr. Smith's late illnesse & indisposition.

I am at present busy in preparing my Catalogue of outlandish plants, with the addition of such as were within the verge of my travels not observed by me, in Magnol's *Montpellier*, C. Bauhine's *Basel*, & M. Hofman's *Altdorffino Catalogues &c.* for the presse. To wch I shal adde Catalogues of 1. *Creticæ rariores*. 2. *Hispanicæ & Lusitanicæ*. 3. *Orientalis*. 4. *Ægyptiacæ*. All this I have undertaken, not by mine own instinct, but the instigation of others, particularly Dr. Robinson, whom in this I was ye more inclinable to gratify, because now I hope I shall come to an end, & doe not see what other businesse they can invent for me. God grant you health, & ease, wch at present I want. I am,

Sr, Yours in all offices of love & service,

JOHN RAY.

I forgate to enquire whether you have heard any thing further of Mr. Beaumonts work against Burnets theory.\* I long to see it. I am solicited upon that account to put my *Physico-theological Discourses* into Latine; but they are not particularly directed agst Mr. Burnets

\* John Beaumont, *Considerations on a Book called "The Theory of the Earth."* 4° Lond., 1693.



theory, though I look upon it as no more or better than a meer chimæra or Romance.

[On the back of this letter is a note by Lhwyd.]

“ March 169 $\frac{2}{3}$ . An urn as big as a bushel taken out of a brook at Ashton Rowant which contained several small urns within it, whereof one had small bones. Several of them had inscriptions. Enquire of Mr. Crook, a joyner in Kingstone.”

132. MS. *Ashmole*, 1817a, f. 222.

For Mr. EDWARD LHWYD at Jesus College in Oxford.

( $\frac{\text{NO}}{28}$ )

Nov. 26, [16]93.

(Date in Lhwyd's hand).

Sr,

I was in some doubt whereto I should impute your long forbearance of writing, whether to indisposition of body, or multiplicity of businesse, or some displeasure conceived, till your welcome Letter resolved me what the true reason was. Yet give me leave to tell you, that though you want other subject, it will be enough for my satisfaction to write only how you doe, & what you are doing. Your kind acceptance of such poor trifles as my Schediasmata are, is recompence sufficient for such presents. It is now become so customary for Writers to distribute Copies of their Books among their friends, that those at least of interiour admission may justly challenge them. I must not passe by without censure the excessive epithete you bestow upon that Tractate, lest you should think I allow & accept it.

I lately received a Letter from Mr. Cole of Bristol, whereby I perceive that from a passage in my *Physico-theologicall Discourses* he hath taken occasion of offence against you, imagining that you dealt not ingenously with him, in arrogating to your self the first invention & observation of figures naturally delineated upon slate

or stone, & making no mention of him. Whereas no such thing can be collected from my words. I only said that I had the first knowledge of them from you, whence you had it I said not. Tis true indeed, I might have taken notice, that in a Letter written a twelve moneth before yt wch I referred to, you wrote that you had seen such stones with Mr. Cole, but it occurred not then to my memory; so that ye blame lies not on you, but me, or rather my forgetfulness; as in my answer to his Letter I have acquainted him, wholly excusing you: and so I believe have set you streight in his good opinion. But Mr. Beaumont hath more reason to be offended at that Passage: for yt I was informed of those bodies by a Letter of his dated June 17. -76, registred in *Philosoph. Transact.* N. 129. p. 739. wherein he writes of them as well known to ye Miners. Now whither of these two Gentlemen observed or found out, or was by others informed of them first, Let them dispute. Howbeit this Letter I had read, but the thing had slipt out of my mind, & no wonder, for now these ἀμαρτηματα μνημονικα are frequent with me. You may possibly have taken notice, if you bestowed the reading of the Preface of the last Book I sent you, that I mention there Dr. Robinson for the person from whom I had the first notice of the Skunk, whereas indeed I find it mentioned & described in a letter of yours wherein you gave me an Account of some particulars wch you saw in Mr. Cole's museum.

I should now communicate to you some Observations of Mr. Paschal's of Somersetshire wch I received from him in a Letter sent me about three moneths since. They were concerning the influence of the diurnall motion of the Earth upon humane & other Animal bodyes; but because they either are already, or will suddainly be published in the *Philosop. Transact.* (for I sent them up to London a good while since) I shall referre you there (?). To say the truth I was much taken with them, being wholly new.

I know not whether I acquainted you with the



Ulcuscula I have upon the hind-part of the small of my legs, wch broke out last winter, & have continued ever since upon one of my legs ; At first I look't upon them only as exulcerated Chilblains or Pernios, & so I believe they were in a great measure. They are very stubborn & ill-natured, & have hitherto resisted & frustrated all means & methods of cure ; so that now I have little hopes of getting them healed & dried up this Winter, if ever. The cold weather doth affect & greatly exasperate them, causing them to run abundantly.

It remains that I return you thanks for your Communications in this last. I perceive the Undertakers for ye reprinting of Camden's *Britannia* intend to make a glorious Work of it : for they have addressed to most of the learned men in England, wch have any skill in such matters, to assist them in it, & to communicate what they know that may tend to ye perfecting of it. I hear Mr. Churchill intends to write to me about it. But truly I have neither skill nor leisure to contribute any thing considerable.

Since the publication of my *Synopsis of Quadrupeds* I have been importuned & prevailed with by Mr. Smith I suppose by the instigation of Dr. Robinson & some other friends at London, that envy my Quiet, to undertake another job of Journey-work ; that is, to enlarge my *Synopsis of British Birds & Fishes* to take in all, & so to make it a general Synopsis, like that other of Quadrupeds. This work is already finished, but I believe will hardly be printed this half year ; for Mr. Motte, who hath now my Catalogues of Plants in hand, will hardly have finished them before that time. And truly I know no other Printer in London that one may trust with the printing of a Latine book but he. Those who were employed in printing my *Synops. Anim. Qdrup.* made but bad work of it, though I had every sheet sent me down to revise before it was printed off, because they corrected not half ye errata that I noted. When this Work is finished I know nothing they can contrive to employ me in & so I think I may take leave of Natural

Philosophy, save only the *Synopsis of British Insects*, wch I have made some entrance upon, but alas my life would not suffice to bring it to any tolerable degree of perfection should I bestow it all upon it, & had I it to live over again. So I take leave & rest,

Sr, Your affectionate friend & svt,

JOHN RAY.

134. MS. *Ashmole* 1817a, f. 223.

For Mr. EDWARD LHWYD at Jesus College in Oxford.

(DE  
28)

B.N., 10br. 26, [16]93.

Sr,

Yrs of the 12th came to hand, in answer whereto. First, though Mr. Cole of Bristol be personally unknown to me yet I discern by the intercourse I have had with him by letter, that he is a little infected with an immoderate desire of honour, & apt to think well, it may be too well, of his own abilities & performances & loath to be defrauded of the reputation of his discoveries. To give him his due, he hath deserved well of the ingenious, as you also acknowledge; and therefore is to be pardoned, if he labour under that disease of wch most men are in some measure sick, I mean affectation of more honour then is due to them, or being too greedy of or solicitously concerned about what is due. Desire of honour is an affection deeply rooted in humane nature & of great use; but it is hard to govern it a right, & restrain it from exceeding its bounds. And the best men can hardly refrain from accepting & owning what praises are offered by the indulgence of friends though exceeding their merit, or at least not refusing them, though they are conscious to themselves of no such abilities or endowments as they are commended for. But not to enlarge further upon this subject, Mr. Cole concerning his *Collections & Observations* writes thus, "My Observations in so long time [as he had before



mentioned that is 50 years] are so greatly increased on me, That it is beyond my ability to undergoe the charge of publishing them, wherefore I doe intend in short time to print my Proposal with this Offer, That if the Society, either University or any single person of Honr & Estate (wch I am incouraged by some intelligent friends to think likely to be successfull) shall assist me in ye charge of their publication, I will give them all up to him or them so soon as it is accomplished, & discontinue my studies or making any more Collections &c. Towards wch generall History I have already about 300 figures (many of them small) almost all new, & of mine own drawing except a very few. In wch Proposals will be set forth their numbers, varieties, value &c. many of them being very considerable in their intrinsick worth. And shall offer that a survey of them be taken by some ingenious persons, whom they shall appoint for that end, before they engage in it: for I have no Relation to bequeath them to, it having pleased God to afflict me sore in depriving me of all my Children & nearest kindred." So you see besides those mentioned in your Letter published in ye *Philosophic. Transact.* there is another person designing to publish upon your Subject. I hope among you all matters will be studied (?), & all difficulties cleared up. Those *Transactions* wherein your Letter was published came not to my hand till after [I had] written my last, else you may be sure I should have taken some notice of it, & returned you thanks for the Observations contained in it, & the honble mention made of me.

The Locusts you write of that came over into Pembroke shire I long to have a full account of. It seems very strange to me that such Insects should make such great flights, & especially so late in the year, & is very extraordinary, & an Ethnick would be apt to think portentous.

The *Hemionitis pumila* &c. I had advice from London more than a year agoe that the Virtuosi there took to be only young Plants of *Osmunda regalis*; & upon further

consideration I was suspicious it might be so ; but I was not willing to write to you concerning it till I were fully satisfied. Be it so, we know a great Herbarist, that is Lobel, committed the like mistake in a plant of the same Tribe, viz. a young *Phyllitis* for the true *Hemionitis*.

I have now read Mr. Beaumont's Considerations upon Dr. Burnet's Theory of ye Earth ; & doe think that he hath fundamentally overthrown it in a few words supposing, as he doth, that the ocean contains no more water than would cover the whole earth to the thickness of one quarter of a mile, & that the caverns of the earth contain but half an ocean of water. But a great deal of stuffe he hath about the mysticall & Allegorical Physiology of the Ancients, wch I understand not, nor I believe himself neither. Your observation of the *Gryllotalpæ* is notable. The Post calls for my Letter, & gives me leave to adde no more but that I am,

Sr, Your affectionate & faithfull friend & Servant,  
JOHN RAY.

**135. MS. *Ashmole* 1817a, f. 223.**

For Mr. EDWARD LHWYD at Jesus College in Oxford.

( $\frac{1A}{23}$ ) .

BLACK NOTLEY, Jan. 22, [16]93.

Sr,

Last Post I received a Letter from you without date, with one enclosed conteining a relation of some Accidents as strange & surprising as sad & deplorable. I gather from yours that you attribute the cause of these events to ye Locusts brought over into these Countreys this last Autumne. In wch opinion I cannot fully concur with you. For though in that place where ye flight of Locusts pitch't there might probably be a great number left dead, & putrefying upon the ground, they might empoison & infect the grasse so as to render it fatal to ye cattell that should feed upon it.



Yet it seems this grasse hath been infectious these three years, probably before any Locusts came over. And if there had been such a quantity of them left dead upon that spot, as by their corruption to invenome the grasse, its likely the tenants of those lands would have found them out & taken notice of them.

The other Accident of firing the ricks of hay I doe not see how it could proceed from ye Locusts. I should be apt to suspect with the Countrey people thereabouts that it was the effect of Witchcraft. For why the fire should burn the hay, & the men that laboured hard in it receive no harm at all, is to me unaccountable & miraculous. However, if it were the effect of some naturall cause, as some inflammative corpuscles brought in by the wind, wch seems probable because it began in all on that side toward the Sea, I doe not see how any humane means can remedy or prevent it.

The infection of the grasse might possibly be help'd by paring of ye sward, laying it on heaps, & burning it. But I am too short-sighted to penetrate the reasons of these Accidents, much lesse to give any salutary advice. I am sensible the Countrey must needs be in a great fright & consternation & under a sad apprehension & dread of some more general Calamity to ensue, wch God prevent. This I have written because you required me as seeming most probable according to the Phænomena communicated by the Worthy Gentleman yr friend. Possibly if one were upon the place, one might upon full information of all circumstances & particulars be able to guesse better at the causes of these accidents, & those who have a comprehensive knowledge of nature, & good inventive heads, might Judge whether any thing could be done toward the putting a stop to any further harm, & what means were most proper to be made use of. For my part I am none of those, having never been favoured by Providence to invent any new or usefull thing in all my life. No more now but that I am

Sr, Your very affectionate friend & Servant,

JOHN RAY.

143. MS. *Ashmole* 1817a, f. 224.

For Mr. EDWARD LHWYD at Jesus College in Oxford.

B.N., June 1, [16]94.

Sr,

Before the receipt of yrs of May 27th I intended to have written to you ; to consult you about one or two particulars. Mr. Churchill & his partners in ye printing of Camden's *Britannia*, at ye instance of some friends of theirs solicited me for some contributions to their Work. I told them that I had indeed by me some Observations made in my Simpling voyages, but without reading over Camden (wch I had not leisure to doe) I could not tell what I might have pertinent to his subject, not already taken notice of & entred by him. But if they thought it might be acceptable to the Readers or advantageous to ye sale of the Book, I would collect & send them Catalogues of the locall Plants in each County.\* By locall I meane not only such as are peculiar to some places, but such as are more rare, that have already been observed to grow wild in such or such places, though they have been discovered also in other Counties, not pretending to all. This offer I found they were willing to accept : So I drew up & sent them such Catalogues of ye particular Counties excepting Middlesex, for wch I referred them to ye London Herbarists, & Wales ; for wch I must referre them to you, who are abundantly better able to perform that task then my self. Now my first question to you is whether they have already addressed to you, & desired your assistance as to this particular. My second question to you is whether Glasse signifies in ye modern British or Welsh language a blue colour as Camden affirms. My reason is because Vitruvius, Mela & others calling *Glastum* in Latine *Vitrum*, I cannot but think that Glasse signified the same to ye Ancient Britains that it doth now to us English, *Vitrum* seeming

\* The Catalogues of Plants for each County, published in Edward Gibson's edition of *Camden's Britannia*, 1695 fol.



to have been nothing but a translation of *Glastum*. Whereas had it signified a blue colour they would rather have translated it *Cyanus* or *cærulea herba*.

The strange Phænomenon of the unparallel'd Fire appearing in Wales this last Winter is rather to be admired then accounted for by me ; yet I know not how it could be attributed to ye Locusts, but rather look upon these two prodigious Accidents as independent on each other, & to have casually concurred. Your account of both I have seen & read in the *Philosoph. Transactions*, & cannot but greatly approve. By the enclosed paper you sent me it seems there hath been the like appearance of Locusts in Germany. The Authour advances a new notion & signification of the Hebrew word wch all Interpreters I have met with render Quails. It were worth while to see his proofs.

I have according to your desire sent you a transcript of that part of your Letter I made no use of in my Discourse concerning the Dissolution of the World. The reason, to say the truth, why I omitted it, was because I was not willing to raise a Diell I could not lay, or start an objection I could not answer : though yet it did not move me much to incline to Dr. Burnets hypothesis ; & probably others ; my self afterwards upon further illumination may be able to resolve ye D'ficulty. But as for Dr. Burnets theory I think Mr. Beaumont hath fundamentally overthrown it, upon grounds not considered by others. Yet methinks his book in many places smels rank of the Enthusiast.

1. At on the highest parts of the Glyder (a mountain about ye height of Cader Idris) there are prodigious heaps of stones, many of them of ye largenesse of those of Stonehenge, but of all ye irregular shapes imaginable, & they all lye in such confusion, as ye Ruines of any building can be supposed to doe. Now I must confess I cannot well imagine how this hath happen'd : for yt ever they should be indeed ye ruines of some edifice I can by no means allow, in regard that most of them are as irregular as those stones

are that have fallen to ye Valleys. We must then allow them to be ye skeleton exposed to open view by rains, snow &c. but how then came they to lye across each other in this confusion, some of them being of an oblong flat form, having their two ends *ex. gr.* East & West, others layd athwart these; some of them laid flat, but many inclining, being supported by other stones, at the one end &c. I must confesse I have seen nothing that appear'd to me so strange as this in all these mountains. Had they been in a valley I had presently concluded, they had fallen from ye neighbouring rocks, but being in the very summit of the Hill, they seem to me unaccountable. I know it might serve to confirm Dr. Burnet's Hypothesis, but for my part &c.

2. The other Observation is not so unaccountable as it is singular, & in some respects opposite to ye former, viz. On ye N.W. side of ye same Hill there is amongst many others one naked precipice, as steep as any I have seen: but so adorned with numerous equidistant pillars & these again slightly crossed at certain joynts, yt should Dr. Burnet see it I believe he would say it is one small pattern of ye frame of ye Antediluvian Earth. I confesse I admired it almost as much as he does (L. 1. C. 9) his precipice by ye Mediterranean Sea: to wch after a long encomium he sayes *Vale Augusta sedes Rege digna* &c. though I must grant that ye Shepherd who was my guide, was far from wishing himself a mansion at this place. So far the Letter.

This Spring hath shewn me many new species, I doe not say of Insects, but of Papilio's & Phalænæ, in quest of wch I have been most diligent. And of those I know of this kind, I have not observed the manner of generation & metamorphosis of a 4th part. So that this Genus alone would be work enough for a man's life. Neither at last would he come to a comprehensive knowledge of all, should he confine himself to the species, to be found in this Island. What hope then of composing a generall History of Insects, those



comprehended under ye name of Flies being more numerous than Papilio's : and the Beetles not lesse. I want eyes, else I might make better work with them.

Mr. Smith now calls upon me for a 2d Edition of my *Synopsis of British Plants*\*: if you have any thing of new Discovery I entreat you would communicate it. Mosses are a new field, such a multitude of species have occurred to me heerabouts that people will think me to abound with leisure if I shall put down all I know : and I doubt not but the London Herbarists & you at Oxford have observed abundance more. For indeed I want eyes to spie them, & the use of legs to wander about in search of them. I hoped to have seen Mr. Doodye's *Bryologia* out before this. Without figures, names and Descriptions will be very fastidious & hardly intelligible to ye Reader. But I shall endeavour so to methodize them & give such certain characteristic notes, that whosoever attends to them shall not fail to understand what species I describe. But I run out too far & shall soon exceed the limits of my Paper. I must begge your excuse for this long περιαντολογία wch I am sensible must needs be nauseous. I am,

Sr, Your affectionate friend & Svt,

JOHN RAY.

144. MS. *Ashmole* 1817a, f. 225.

For Mr. EDWARD LHWYD at Jesus College in Oxford.

( $\frac{IV}{12}$ )

B.N., June 10, [16]94.

Sr,

I recd yrs of June 10th & thank you for it. I am now satisfied concerning the signification of Glasse in the modern British : but I am still of opinion that to ye Ancient Britains it signified, as now it doth to us in English, Vitrum, for the reason alleged. Howbeit I doe not deny, but that the word originally might signify

\* Published in 1696.

a green or blewish colour, as *βάλλινος* derived from glasse, did to ye Greeks ; & Glasse might to ye Britains be so called from its colour, as ye colour to ye Greeks was denominated from Glasse. Possibly afterward the Britains might relinquish their old name for Vitrum, to avoid ye Homonymie, & take up ye Latine: and the Saxons might retain the old Celtick word for glasse & bring it with them into England. For Cluverius in his *Germania Antiqua* proves that ye Celtick language was common to Germany with us & the French, (I meane the Ancient Britains & Gaules) & other northern Countreys. But surely the present Dutch or Teutonick language is originally different from ye ancient Celtick or British & Gallick, being nothing but a dialect of ye Gothick. How ye Celtick came to be lost in Germany & the Teutonick introduced I know not.

Mr. Morton whom you mention is an ingenious person, who was once heer with me, & he holds correspondence by Letter with my neighbour Mr. Dale, the Apothecary.

The Bookseller now calls upon me to prepare my *Synopsis of British Plants* for a 2d Edition, wch being like to be ye last I shall put forth, I am desirous that it be as full & emaculate as I can make it. My request therefore to my friends, skillfull in such matters, & especially to your self is to lend me their assistance in order thereto, & particularly to inform me what Errata or mistakes of Printer or Authour they have noted in this first edition, & what they have observed redundant or deficient therein.

I shall hint to you one or two particulars wherein I desire satisfaction.

1. That capillary you sent me by ye name of *Lonchitis altera* Matth. I find figured in Dr. Plukenet's *Phytograph*. Tab. 89. F. 6. by ye title of *Filix parva Cambro-britannica, pinnulis latis auriculatis brevibus aculeata*.\* I took the sample you sent me to have been a leaf of a young plant of that kind of *Lonchitis*, as

\* Probably *Polystichum Lonchitis*, see *Syn.* 118 (Druce).



you intitled it. But observing ye leaf figured by Dr. Plukenet to be exactly like mine, I am in some doubt whether it be so or not. If it were a leaf of an adult Plant you sent, then I am of ye Drs. mind that it is a new species, of wch I must pray your resolution.

2. I stand also in some doubt about your *Filix Lonchitidi affinis*.\* For though I am still of opinion that it is the same plant wch grows heerabouts, yet I begin to suspect it may be a different species from Mr. Goodyer's *Filix mas non ramosa pinnulis latis auriculatis spinosis*: For his description in *Ger. emac.* doth not agree to it, & I have a sample among my dried plants seemingly different, wch answers better to Mr. Goodyer's description. See Dr. Plukenet's figures, who yet seems to me to multiply species without necessity.

3. I find in ye Snowdon Catalogue sent me by Dr. Robinson a Fern entitled, *Filicula Alpina non ramosa foliis magis obtusis, An Filix saxatilis non ramosa minima Raii*, wch I am in doubt whither to referre.

4. Your *Alsine myosotis lanuginosa Alpina grandiflora, seu Auricula muris villosa flore ample membranaceo* Dr. Plukenet affirms to be the *Auricula muris pulchro flore albo* J.B. or a variety of it; of wch I desire resolution from you. For I find the Doctor not to be infallible.

The Copy of my *Synopsis Methodica Avium & Piscium* hath been already some while in ye Booksellers hand, but he makes no hast to print it, & perchance he may have reason.† Such kind of books he knows in these streight times will goe off but heavily; wch in the best are but few mens money, as well because of the subject, as because of the language in wch written.

I have, because you seemed not willing to undertake it, drawn up for Mr. Churchill a Catalogue of more rare plants growing spontaneously in Wales, to be added to ye rest of my locall Catalogues sent him before. I am sensible that it is short & deficient, & that you would

\* See pp. 189, 194.

† The *Synopsis Methodica Avium et Piscium* was not printed until 19 years later in 1713.

have done it much better. I wish you good successe in all your studies & labours for the advancement of reall & usefull knowledge & rest,

Sr, Your very affectionate friend & servant,  
JOHN RAY.

145. MS. *Ashmole* 1817a, f. 227.

For Mr. EDWARD LHWYD at Jesus College in Oxford.

Seal.

AV  
18

BLACK NOTLEY, Aug. 16, [16]94.

Sr,

Yours of ye 6th instant spent not much time in coming so farre as from Cardiganshire, I receiving it upon ye 14th. It arrived soon enough for ye resolution of my Queries, my *Synopsis* being not yet sent away, nor indeed quite ready for ye presse. The subject of Mosses causes this delay. I expected to have seen Mr. Vernon of Peterhouse in Cambridge heer, who hath been more industrious in searching out, & more succesfull in finding the species of that Tribe then any man I know, but he comes not, so that I must transact all with him by Letter. He hath communicated to me dried samples of many sorts wch I had not discovered, & shewn me more: but I am not able by these to give so good a judgement or Account of the plants, as he who hath seen them growing in their natural places. I was in some hopes also to have seen Mr. Doody's *Treatise of Mosses* before I had sent away ye copy of my *Synopsis*, but deferred not upon that Account.

My first & second Queries you have fully answered, so that I need say no more of them.

As to ye 3d concerning ye *Filix Lonchitidi affinis* I am now satisfied that it is a plant specifically distinct from *Filix mas non ramosa pinnulis latis auriculatis*



*spinosus Goodyeri*. The question still remaining is, whether it be the same with that I mistook for Mr. Goodyer's auriculate Filix, wch I told you grows plentifully heerabouts. I shall give you the differences I have noted between these two plants (for I have lately observed this last of Mr. Goodyer not lesse frequent in our neighbourhood then ye other) & leave the determination to your judgement.

1. The entire leaves of that wch I take to be ye *Filix Lonchitidi affinis*, though they be as long as those of Goodyer's, yet are they considerably narrower.

2. Both ye tarsi or branches & ye pinnulæ or simple leaves grow thicker or closer & nearer one to another in that then in this of Goodyer, the pinnulæ being contiguous so that you can scarce see ye light between them.

3. The pinnulæ are larger, sharper pointed, & of a more dense texture, so that they doe not so soon flag or wither, smother & as it were polished, paler also & not of so dark a green, & though they have Auriculæ, yet are they not so far extant & apparent considering ye bignesse of the leaf.

I did not remember that I had written to you before about ye *Alsine myosotis*. This forgetfulness pardon & impute to my Age & decay of memory.

You doe very probably conjecture that Dr. Plukenet hath figured ye *Caryophyllus pumilis Alpinus* for a new plant: but since he hath told us, by way of caution, lest we should run into such a mistake, that it is different, the plants are to be more diligently compared, indeed, as far as I remember the calyx & flower of that growing on ye Alps is much larger then that his icon represents. Dr. Plukenet may impose upon himself & us by young & imperfect Plants, especially of the capillary kind, wch differ much from themselves in their youth & in their state. Such ought to be figured & described when adult & perfect, & the difference between young & grown up noted.

I return you thanks for Mr. Woodward's Letter you

were pleased to send me. If you desire it again & have not taken a copy of it, I shall return the original. I perceive thereby that there is a straiter tye of friendship & confidence between you two then I had thought, wch is a great argument & testimony of your ingenuity. He undertakes great things, & I hope will perform accordingly. Four such learned & industrious naturalists being busy upon ye same subject, I doubt not will produce something answerable to ye expectations of the learned world, & will in some measure clear up those difficulties wherewith the original of those bodies is entangled, & reconcile all to the novity of the World & Scripture history of the Creation & Deluge. Something in that Letter I doe not well understand, that is some marks on the back of the leaf of a cole-plant, you observed. Those Cole-plants being only impressions upon ye slate, I doe not see how you could note any marks upon ye back of them, unlesse upon the slate be marks of both ye sides or superficies of such leaves whose impressions they beare.

I am not troubled that Mr. Smith makes no more haste to print my Synopsis of Birds & Fishes. It conteins nothing new or unpublished in other books, except what Dr. Sloane hath communicated. The Method is the same with that of Mr. Willughbyes Histories of ye same subjects. No Anatomicall observations, those would have swelled ye book to too great a bulk for an Enchiridion. It may be of use to poor students who have not ability to purchase great volumes, & desire some insight into those Histories. I have given short descriptions of each species containing the chief characteristic notes, whereby they may be distinguished from others of the same genus.

Mr. Dale I suppose intends to adde to his English history of British & officinal plants the Welsh or ancient British names. I shall acquaint him with your kind offer when I next see him, wch will not be long ere.

I take notice you write Dr. Sherard, whence I gather that he is so to be qualified.



Your Letters & communications are, as they well deserve, very welcome to, & much esteemed by

Sr, Your affectionate friend & servant,

JOHN RAY.

[At the end of this letter is a long note by Lhwyd.]

146. MS. *Ashmole* 1817a, f. 228.

For Mr. EDWARD LHWYD at Jesus College in Oxford.

B.N., Sept. 7, [16]94.

Dear Sr,

I thank you for yr last of ye 2d instant. Your *Filix Lonchitidi affinis* I doe now suspect to be a different sort, as well from Mr. Goodyer's *Filix mas non ramosa pinnulis latis auriculatis spinosis* wch I lately observed growing plentifully heerabouts; as also from that other Fern no lesse plentifull then ye former, wch I mistook for Mr. Goodyer's, & was pretty confident was the same with yours; the entire leaf whereof is a foot or cubit sometimes long, & hath growing on each side ye middle nerve or rib 30 or even 40 surculi or tarsi, not opposite one to another, each of wch is compounded of 15 or 16 pinnulæ auriculate, & prickly about ye edges, & not standing by pairs opposite to one another. This seems to differ from yours in that the particular pinnulæ are sharper-pointed, & their prickles shorter then those of yours; & I guesse ye surculi, as I call them, are much longer. The leaves of this hold green all winter.

I think it adviseable for you to accept ye perusall of Mr. Woodward's papers, lest he should interpret your refusall to proceed from some sinister principle or disposition in you towards him & his undertaking: & if you find it merits it, to give him encouragement & assistance in carrying on his work, & friendly to advise him of what defects or mistakes you discover therein. I know not but Divine providence may favour him with a peculiar illumination to penetrate further into this

matter then other men have done. Though I be at present of your mind, that there is little likelihood of demonstrating how the Universall Deluge could lodge these bodies so deep in ye bowels of ye mountains & rocks; yet it would be a great satisfaction to me to see it well made out; or any good attempts toward it; & I should be willing to learn what any rationall men have to say in favour of such an opinion. It will be a harder task I conceive, to make out that those Mock-plants have ye same original, though what you offer agst it holds equally agst ye Mock-shells.

Delineations of Birds upon Slate, wch you mention, are very strange & scarce credible; therefore I shall suspend all discourse or enquiry of them, till I be fully satisfied of the matter of fact. I have seen in museum's stones, on wch have been ye perfect impressions of ye Sceletons of Fishes, & as I remember Aldrovandus in his *Museum Metallicum* hath figured many. Those characters you mention are very strange & remarkable, but whether they be ye impressions of seed-vessels you are best able to judge who have seen them.

The phænomena of the strange fire in Merionydshire are very odde & unaccountable: there is thereabout some unknown combustible matter inflamed in ye bowels of ye Earth; the fumes whereof may have some deleterious quality.

My opinion concerning the origin of Pearls is little worth, because I never curiously examined them. I take them to be morbose concretions, like the stone in ye bladder, or ye Bezoar in the stomach of some Animals: & the rather because some who have written of them tell us that by the roughnesse & inequality of the shell without side they can tell wch fish have Pearls in them, & they tell us that this disease is a kind of leprosy.

I doe not remember, nor can I find among those dried plants you were pleased to send me any specimen of that sort of Sorrell you mention.

I shall as an Auctarium give you an acct of an



observation of Mr. Paschal's concerning a manna he noted last spring. In a Lr dated Aprill 24 [16]94 he writes thus. "I have suspected that in this unusual constitution of ye Air we are now in, the sulphureous steams have abounded, partly from beautifull & promising blowings of fruit-trees, & from ye warmth of ye season, & from ye freqt lightnings we have. Last night I noted in mine own orchard, in this my low Countrey habitation wt confirms me in it. Walking between two fair Codling-hedges I noted something to fall white upon my hat. It felt clammy and tasted sweet. I took it off with my knife: the white grains ran into a clear liquor, & in a short time I was able to get together a small quantity into a little gally pot that I keep. Upon shaking of any bough, this would fall as a mist doth. All day in these hedges was a noise as of a swarm of bees. [*Doubtlesse this noise was nothing but the humming of a company of Bees busy in gathering the honey.*] We saw it lying upon ye leaves as well as blossoms. I have noted honey-dews, wch doe much hurt to our corn, but never thus early, nor in the form of Manna. Taking some on a broad smooth leather, I observed they did not dissolve presently, but ran along as small round seeds upon ye motion of the leather."

I have done when I have told you that I am

Sr, Your affectionate friend & servant,

JOHN RAY.

151. MS. *Eng. Hist.*, c. 11, f. 50.

For Mr. EDWARD LHWYD at Jesus College in Oxford.

( $\frac{AP}{11}$ )

BLACK NOTLEY, Aprill 8, [16]95.

Dear Sr,

I cannot but take it very kindly, that you should be so solicitous concerning my health. I thank God I am now pretty well delivered from that long continuing

Diarrhœa, wherewith I have been afflicted this last Winter, and that by a very easy and pleasant medecine, Naples-bisket boild in milk. For though I could stop it at any time for a while by ye taking of a liquid laudanum, after a few days it would return again. But since the use of this it hath by degrees left me. Possibly I may mistake *non causam pro causa*, & that the cure may be at least in a great measure owing to ye season of the year; but I think I doe not, the weather still continuing winterly.

As for Dr. Woodward's *Hypothesis*, if he had modestly propounded it as a plausible conjecture, it might have passed for such; but to goe about so magisterially to impose it upon our belief, is too arrogant & usurping. I cannot but wonder to find such a strain of confidence & presumption running through his whole book that he should be so highly conceited of an Hypothesis for wch he hath no other proof but a negative one, I mean, that those bodies must by this means be thus lodged & disposed, because they could not possibly be so otherwise. But first we are to examine ye Phænomena upon wch he grounds this *Hypothesis*. I suspect they will all answer. You have proposed one strong objection about ye *Echini*, wch I doe not see how he can remove, & for my part, I have gathered cockle shells wch are of the heaviest, upon ye surface of the Earth both in England & beyond ye Seas in great plenty. I shall not further censure it, only give you my very good friend Dr. Robinson's opinion of the Author & his Work. He writes (saith he) with a high hand, unbecoming his station & character, & shows too much ostentation. He has taken part out of Steno's *Prodromus*, & your Works, in ye rest he is singular vain and impetuous. He pretends to have compared ye Old & New World in every particular, but in discoursing with him I discover his ignorance in ye History of both, especially Asia & America, where he affirms ye Animals are ye same, & ye migration out of the first into ye latter demonstrable, though he knows not when nor wch way.



His motion of Gravity is ridiculous (though he tells me he hath written 40 sheets upon it) as also that of Springs &c from ye Abysses, the heat or fire being between. I wonder how his shels should sink lower then metals in ye great Fluid, or how the whole Fossil part of ye Globe should be dissolved in ye Deluge when as the Animal & Vegetable remained entire & untouched. But the revealing of these secrets he reserves for his greater Work, to set us alonging for the publication of it.

In another letter he tells me that this [*several words are scored through and overwritten*] an Argument of their skill in Natural Philosophy. *Indolent men that have not been conversant in these studies & enquiries, nor taken any paines to search out & examine these bodies, & observe their places & beds, cannot be [compe]tent Judges of these things.* The Dr. proceeds. "I take Mr. Lhwyd of Oxford [to be a] man of another temper, & greater both skill & discretion, & wonder his friends do not presse him to publish his Lithology, wherein I expect to find matter of sense and soundnesse of Judgement without any Chimerical whimsies or Castles in ye Air." You see, Sr, the Dr. upbraids me, though not singly, with negligence of ye Advancement of true & solid Philosophy, for not importuning you to hasten ye edition of yr Lithology.

I would gladly see Mr. Beaumont's *Hypothesis* of wch he gives us a hint in his confutation of Dr. Burnet's Theory of the Earth p. 30, where he tells us, that he is of opinion that there is no mountain on ye earth now, that is an original mountain, or that existed when ye World first rose, & concludes with Aristotle that ye Sea & land have changed places, & continue so to doe; & that he thinks it not possible for any man, fairly to solve ye Phænomenon of marine bodies found in mountains, by any other Principle. You see he also proves his Hypothesis by bringing us to an Impossibility of solving the Phænomena in any other way; and yet Dr. Woodw[ar]d hath invented another.

It were no difficult matter, I believe, to furnish him

with argum[en]ts more than he could readily answer agst his *Hypothesis of Antediluvian plants*, raised from those impressions upon Cole-slate resembling the leaves of plants ; but I am not sufficiently qualified for such a task, as having never seen the varieties of them, nor the places where they are found, & their other Accidents. Your Argumt would be valid against him, were the word we render ‘prevailed’ to be understood of ‘increaseing’ : but expositors understand it only of continuing upon ye Earth without abatement so long ; wch makes rather for his *Hypothesis*. But the other particular concerning the unnecessarinesse of continuing the rain upon ye Earth to 40 days if ye World were dissolved in lesse than half that time holds good. But he commits another mistake in ye time of ye commencing of the Floud, wch he supposes to be in ye Spring, whereas it was, according to ye best expositors, in ye Autumne. For *Tigri* wch answers to our September was accounted ye first moneth of ye civil year, so ye 2d moneth answered to our 8ber. True for indeed the Ecclesiasticall year began in March, of wch beginning the deliverance out of Egypt was ye occasion. (This being not the old beginning disused in Egypt, & taken up again, as he would have it.) Notwithstanding wch ye civil year began as of old it did in September. One or two things let me ask you, whether the impressions be all of leaves or parts of leaves smooth & extended, or crumpled & folded up. For if they be all extended & smooth without any folds, plaits or wrinkles it is an unanswerable proof that they never were the impressions of Plants. And seeing the leaves of every plant have two different superficieses, whether the two contiguous laminæ of slate, between wch such leafes of Plants are supposed to have layn, have two different impressions, one of ye superiour, the other of ye inferiour surface of ye leaf. That the leaves, at least many of them, are of Plants not now to be found either wild or cultivated with us, you tell us in your Additions to Flintshire : where also you take notice of this work we are discoursing of, &



give a favourable character of its Author. I could adde much more concerning this book, but my Paper will not admit it. I wish you may find such encouragemt from ye Gentry as may enable you to undertake the task of collecting materials for a naturall History of Wales, & in time writing and publishing it, a thing exceeding desireable, & for wch none so well furnished with the requisite qualifications of learning, industry, judgemt, veracity as your self, at least so far as I know or have heard. I am

Sr, Your affectionate friend & servant,

JOHN RAY.

154. MS. *Eng. Hist.*, c. 11, f. 51.

For Mr. EDWARD LHWYD at Jesus College in Oxford.

BLACK NOTLEY, Oct. 8, [16]95.

Dear Sir,

I should before now have sent you advice of ye receipt of the Box of stones adorned with ye effigies of plants whether engraven or impressed upon them, but that I was loath to trouble you with empty & unnecessary letters. I thank you for ye sight of these figures, by the inspection whereof I am inclined to think, that they are the vestigia or impressions of Plants themselves rather than *lusus naturæ*; though I confesse those various & confused figures dispersed through the flakes of the Glocestershire slate would perswade me to be of your opinion, & embrace a middle way: though when I consider that we shall make but little advantage of it; but shall be as much puzzled to give an account, how those bodies we acknowledge to have been the spoils of Animals should come to be lodged in the places where now they are found, as if we granted all of them to have been such, I cannot but stagger & remain irresolute. As to Plants. You once sent me a passage transcribed out of one of Dr. Woodward's Letters, wherein he affirms, that he hath seen the substantiall plants themselves that left their impressions upon the

plagulæ of slate; & appeals to Dr. Plukenet & Mr. Doody to whom he shewed them, who did acknowledge them to have been reall plants &c. Whereupon I wrote first to Dr. Robinson to enquire of those Gentlemen concerning the truth of this particular, from whom not receiving full satisfaction, I wrote lately to Mr. Doody, who returns me this account; “Dr Woodward has shewed me slates, wherein were not onely shades of plants, as in ye Dendroides, but ye reall body, only become very hard by imbibing the stony particles. On one side of the slate was a cavity with the impress of the leaf; on the other side it was prominent, and in both every little lineament, so exact, that I could not doubt, that they had once grown.” So far he. Such a diversity as we find of figures in one leaf of Fern, & so circumscribed, in an exact similitude to the plants themselves I can hardly think to proceed from any shooting of salts or the like. The instances you give, though they come near, yet doe not come fully up to a parallelism with such figures. Yet on ye other side there follows such a train of consequences, as seem to shock the Scripture-History of ye novity of the World; at least they overthrow the opinion generally received, & not without good reason, among Divines & Philosophers, that since ye first Creation there have been no species of Animals or Vegetables lost, no new ones produced. But whatever may be said for ye Antiquity of the Earth it self & bodies lodged in it, yet that ye race of mankind is new upon ye heart, & not older then ye Scripture makes it, may I think by many argumts be almost demonstratively proved: & likewise it seems to me that ye Earth it self, I meane this Terraqueous globe, is in a forced & preternaturall state, ye earth above ye water, wch is lighter then it, so that did not ye Scripture tell us so much, one might by reason collect, that the Water was sometime uppermost & covered all. But enough of this.

The Glocestershire lump of slate was so wet, that so soon as I opened it, it broke & crumbled into small



pieces scarce any so big, as to be worth ye sending back : and I find what you observe to be true, that those figures doe many of them disappear in time being exposed to ye Air.

The other three stones are indeed choice rarities, wch I shall be carefull to remitt to you ; but one of them, & that too wch you value most is to my grief broken asunder crosseways, by the negligence I suppose of some child or servant, who in my absence taking it up to look upon it let it fall. The impression upon it resembles the leaf of no plant known to me, & is indeed very strange.

I was in hope before now to have sent you a Copy of ye 2d Edition of my *Synopsis of English Plants*. But the Edition hath been stop't a great while by Mr. Doodye's dilatorinesse in sending his observations, wch are now received, & sent up to ye Printer, so that I suppose the Book will be finished & published in a short time.\* There are in it above an hundred new species of *Fuci*, *Musci* & *Fungi* ; and yet I believe, were diligent search made, there might as many more be added of those kinds. But most Readers will be apt to think, there are too many of them already.

Monsr. Tournefort's *Elem. Bot.* have exercised me for some weeks. But I must now lay it aside for this Winter. Insects I find so numerous, & ye observation of all ye kinds of them, but Papilio's, so difficult, that I think I must give it over. It were a fitter task for a young & ingenious person, who had the perfection of all

\* The *Synopsis* and Doody were also in the mind of Lhwyd when writing from Oxford on Dec. 5, 1695, to Lister:

" . . . I had done something in this matter [referring to the *Synopsis* he is writing] long since ; even when Mr. Ray was pleased to promise it ; but that I was hindered by a tedious Catalogue of Pamphlet's and MSS. which required about two years time, and afterwards by Camden. . . .

" I have been importun'd to ask you (I need not tel you by whom) whether you are fully satisfied of Mr. Doody's experiment of ye growth of Misselto from seeds, inserted by him into a white poplar. Mr. Coles asks such ridiculous Questions ; as whether you and Dr. Plucknet (for Mr. Ray quotes you both) saw Mr. Doody put in ye grains or berries ; and whether you are certain the Plant sprung from ye very same place, he put in ye seeds etc. . . ."—(MS. *Lister* 36, no. lxxiv.)

his sences & time enough before him. I doe, & must, lest I would deceive my self, consider & understand that I have one foot in ye grave, & ought not to bestow all my time & thoughts upon these enquiries. I feare I have stept too much out of my way in doing what I have done already in this kind; wch though it be but little & far from exact, yet I think may have been of some use to whet & excite others, & that (as Horace saith) *functus sim vice cotis acutum reddere quæ ferrum valet exsors ipsa secandi*.\* But I will not run too far out in this περιαντολογία, but conclude with prayers for a blessing upon your studies & endeavours, resting

Sr, Your very affectionate friend & humble Servant,  
JOHN RAY.

156. MS. *Eng. Hist.*, c. 11, f. 53.

BLACK NOTLEY, Jan. 22, [16]95.

Sr,

I received yrs of Jan. 12th with the enclosed paper, wch I have this day dispatched to London to Dr. Robinson, to be by him delivered to Mr. Moyle, with whom I have hitherto held no correspondence by Letter. All that I had of him was by word of mouth, when he was heer with the Doctour. I hope shortly to receive an Account from him. As for any Cornish manuscripts I believe there are very few if any in the Countrey. The language, when I was there (near thirty years ago) was retired into the extreme angle of Cornwall, not above two or three parishes where it was spoken, & there by the vulgar only. We could hear but of two men only that could write it. Mr. Willughby (with whom I then was) got from one of them a Catalogue of the most usuall words, wch we found to differ very little from the Welsh. Their language also is so little different from the Bas Bretaigns in France, that they understand one another, as we found by severall

\* *Ars poetica* 304.



Fishermen of that countrey wch were then drying of cartilagineous Fish at Pensans & St. Ives.

I wish & hope that your design may & will find such acceptance & assistance as may encourage & enable you to undertake & proceed in it.

I have this morning sent back the box of stones with ye figures of plants, & thank you for the sight & use of them, & am sorry they have received so much injury heer and by the way. The Lichen of wch you sent such plenty in ye bottome of the box, I take to be the *Lichen sive Hepatica lunulata* ἐπιφυλλοκαρπος Synops.

I am now at the request of Mr. Smith carrying on a Supplemt of my History of Plants, wch will be little else but what I shall transcribe out of books, being not in condition to travell up & down to visit Physick gardens to view & describe such new & non-descript species as I should find there : wch yet would be necessary to render the work perfect. The opposition of some persons constrains me still to spend time on this subject of Plants, wch I thought to have quite laid aside. What mistakes have been discovered in my writings I shall willingly own & correct : what is good & usefull I shall maintain & defend, & therefore intend something further in answer to Monsr. Tournefort. I am

Sr, Your affectionate friend & servant,

JOHN RAY.

157. MS. *Eng. Hist.*, c. 11, f. 54.

FOR MR. EDWARD LHWYD at Jesus College in Oxford.

BLACK NOTLEY, Feb. 3, [16]95.

Sr,

Last week I recd from Dr. Robinson an answer to my Letter wherein I enclosed the Printed paper you sent me, an Extract of that part whereof wch concerns you I shall give you, to prevent mistake in his own words.

“ The Paper conteining Mr. Lhwyd’s printed proposalls

was presented by me the other day to Mr. Moyl, who promises me to give some directions about Cornish MSS & other rarities in that Countrey. I have also propounded the design to severall Noblemen & Gentlemen, who all approve of it, & say they will contribute towds the carrying it on. But they all object against ye length of time, as being a Mans life, & they all wish it might be done yearly by way of Itineraries or Diarys, out of wch the great Work might at last be composed. Such a method would give frequent satisfaction, & take off all those aspersions wch lye upon some persons, whom I need not name.

Another piece of Advice I wish you would be pleased to recommend to Mr. Lhwyd & that is the immediate publishing of that usefull Synopsis of figured stones & Fossill whorls wch he hath ready by him for the Presse. This would be a reall specimen of his Abilities in naturall History, & his intentions to gratifie the World with his Discoveries of Products of that kind. For his enemies heer give out that he neither will nor can perform any thing to the purpose. Dr. Woodward is his mortall enemy (upon what Acct I know not) & doth him all the mischief he is capable of, wch is not much, for ye Dr. begins to be contemned in all places for his conceited & insolent behaviour." Thus far the Doctour, with whom I cannot but consent in pressing you to hasten the edition of ye piece he mentions, wch you have made some promise of to yr friends, & they have communicate so much to others, so that it is expected. One great reason, why Dr. Woodward is so much your enemy is I conceive those particulars in the printed essays, wch he knows must come from you, and thinks immediately, though he be therein mistaken, that Authour receiving them at ye third hand. Indeed I am accessory though unwittingly to his indignation. I know it is a hard task to give a good Account of the originall of Fossill shels & formed stones, & a satisfactory Answer to all Objections against either opinion: & therefore a man hazards his reputation that is positive & confident on



either side. The like may be said of the Delineations of Plants upon Slate or other stones. I did once embrace a middle way, to wch I see you are now somewt inclined, but now I think that if nature may form any for her disport, she may as well form all, & I see no reason of making a difference between them. And if reall shells & Fish-bones be found at great distances from the sea, it may rationally be thought that the formed stones wch are there found may ow their originall to them, especially since it is observed that oyster shells will in time thicken & grow into the shape of those stones wch [have] bene found in gravell pits & wch the vulgar heer call hobgoblins claws.

I hope you have received the box wch with thanks I remitted a [fort]night since. I am,

Sr, Your affectionate friend & humble servant,

JOHN RAY.

158. MS. *Eng. Hist.*, c. 11, f. 55.

For Mr. EDWARD LHWYD at Mr. Rice Morgans Schoolmaster at Bangor in Carnarvonshire.

( $\frac{IV}{9}$ )

BLACK NOTLEY, June 8, [16]96.

Sr,

Trusting memory & not having recourse to yr Letter, I find that I have slipt the time when I should have written. However though I may have frustrated your expectation, yet because I suppose Mr. Morgan knows how to convey a Letter to you, I thought fit to write, though I have little other matter then to excuse my self for not having done it before. Concerning the Originall of formed stones I have nothing considerable to adde to what I have already published. I suppose you have seen the notes, taken out of *Agostino Scilla* & inserted in ye *Philosoph. Transact.* of January & February.\* He proves well that these bodies were reall

\* An account of Scilla's *La vana speculatione*, 1670, in *Philosophical Transactions* xix, pp. 181-201.

shells or stones cast in them as in molds, & that they were lodged in such places as they are found in, by inundations of the Sea. But what inundation of ye Sea could carry them up to ye upper parts of high mountains. I have my self seen in the mountainous countrey of the Peak in Derbyshire great lumps of white stone almost as hard as marble, so amassed of small fragments of shells of different kinds, that I could not think it possible for any volutation of the Sea so to break them. I have also some lumps of Bufonites\* got in Malta, (where are plenty of such to be had) in wch a great multitude of small bodies of that kind are cemented so close together and that so elegantly in rows, that it is hard to believe such a number of teeth & nearly of the same size should have ever been brought together & so disposed by chance or ye working of the Sea.

His observations concerning the strata or beds whereof the mountains at or near Messina are composed ; wch lie in this order, first Gravell, then midling sand, then very fine sand ; that after 3 layers of sand & gravell of different fine-nesses, come 3 other layers in ye same order with the former, & so on severall times one after another, are considerable, but his Acct, though as good as I know any, not altogether satisfactory. I doe not see how this disposition of beds can consist with Dr. Woodward's Hypothesis of the sediments of the generall deluge ; for so there could be no repetition of the same order of Beds. I have formerly objected against the Generall Deluge bringing in shels the causes that the Scripture assigns of that Deluge viz. a rain of 40 days, & the breaking up the fountains of the great Deep or bringing the subterraneous waters upon ye superficies of the Earth ; & not any inundation of the Sea at all : wch causes were more likely to carry down shels to the sea then to bring any up ; especially so far as into ye midst of great Continents. Most consonant therefore to ye Scripture & to reason it seems to me that at first the Earth was covered with water ; that ye land was

\* Merret had already declared Bufonites to be fish teeth.



raised up by subterraneous fires at the Divine command, & that gradually first where Animals & men were created, & then further & further, the waters being driven back. Afterward when the greatest part of the Earth was thus raised, the skirts were alternated by the sediments of rivers & floods, whence & from ye inundations of the sea came the severall beds or layers of Earth. The finding of a bed of shells upon sinking a well at Amsterdam at above 100 foot depth seems to me an evident proof, that there was then the bottome of the sea, & that all the earth above it was but the sediments of great floods. But no more of this subject. Your Query concerning the Sea-horse teeth I [ ] to, not being sufficiently acquainted with those bodies, nor the nature of the Animal. I recommend you & yr ende [ ] protection & blessing, resting,

Sr, Your affectionate friend & servant,

JOHN RAY.

189. MS. *Eng. Hist.*, c. 11, f. 56.

BLACK NOTLEY, March 12, 1697.

Dear Sir,

I am sorry your Lrs to me should have the ill hap to miscarry, & so you lose the pains of writing them, & I the pleasure & satisfaction of reading. Pardon me now if I trouble you with a brief account of my present condition, wch is such as I know your tendernesse will commisserate. During this extremely sharp & long continuing Winter I have been sorely afflicted, partly with a Diarrhœa, wch after stopping frequently recurs upon me, & hath forced me sometimes to rise more then once in ye most bitterly cold nights ; partly by the sores upon my legs, with wch I have been troubled some years, but they have this winter been more grievous & painfull then ever, so that they frequently hinder & interrupt my rest. But a sadder calamity then these hath lately befallen me. You may possibly have heard, though I doe not remember I ever told you, that I had

4 Daughters, the two eldest of wch were twins, under the age of 14 years. Of these (twins) the younger was cut off by a disease that is rarely mortall, ye Yellow jaundice, for want of using convenient medicines, we putting too much confidence in a young Physician, who thought himself to have an infallible cure.\* This makes the losse more grievous; though the child was very ingenious, & helpfull to me, & upon that account the more dear too, wch considerations added to that naturall *στοργή* in Parents, render this death a sore blow to me.

But to come to ye subject of yr Lr. Your opinion concerning the origin of marine shells & coal-pit plants, I must needs acknowlege to be very ingenious, & probable, nor indeed could it otherwise find any entertainmt or approbation with a person of your sagacity & judgmt. But you have started such considerable objections against it as are very hard to answer. I leave them to your further consideration. I am of opinion with you, that the severall parts of animate bodies are made of ye severall parts of the seed. I can also easily allow that these parts may be separated & act separately from each other, as appears by monsters wanting some parts, & having others in undue places or enormously great. Only we see that the seeds of these bodies (wch are indeed nothing else but the very bodies themselves in piccolo, indeed with mentative power) grow by

\* The young physician was Dr. Benjamin Allen, aged 31. Mr. Miller Christy has printed some of his remedies in the *Essex Naturalist*, xvii, 1911. Allen gives the following account in his Common-Place Book, p. 203. "I have had notice [by means of dreams] of several extraordinary patients deaths. A little before Mary Ray dy'd, [Jan. 1697-8], about a fortnight or three weeks or less, I dreamt, in a morning, as before, I was walking with Mr. Ray down Rain Lane, and seeing an apple tree, pickt one, before it was ripe. And immediately I saw Mr. Ray on the other side of the hedge in the field, and no stile to get over to him; so we walkt and talkt, but [I] got no more to him; and so it fell out upon her death; [for] a distrust came by Mrs. Ray's charging me that I did not sufficiently press the means I had sent her [for the cure of her da. Mary; but] that was her fault, for I had sent her a preparation of steel, which would have cured her and prevented her death. So intimacy discontinued, though we never fell out, but [he] invited me to his hous. But, without difference, we were at a distance."

Ray, writing of Allen, c. 1700, refers to him as "eruditissimus, et ingeniosissimus amicus noster D. Benjamin Allen, Braintriæ, in Essexia, medicinam faciens." Miller Christy, *l. c.*, p. 152.



separating parts from a fluid, & continually applying them to themselves. Now it is hard to conceive how this can be done in stones. The instance of those sorts of Fern-leaves observed in ye ice of urine &c answers not to the formation or rather ye growth of an animate body from ye seed, that being done by one simple projection at once, not to say this urine is the greatest enemy to vegetation that may be. Some objection also against this Hypothesis, for it may be, that according to Dr. Woodward's observation these bodies are for the most part found sunk and lodged in beds of the same specific gravity. Then the lodging of shells in beds or strata of mud or gravell, & some of them being by long lying as it were calcined & easily dissoluble to powder doth as it were tell us, that such beds were sometimes the sea-shore, it requiring a very long time so to calcine these shels. Heer at Harwich a bed of shells hath lately been found by Mr. Dale, near the top of the cliff, at least 40 foot above ye shore; this bed of a considerable thickness, mixt with sand & gravell. Therein are all sorts of Bivalves & Cochleæ most of them calcined to powder or in small fitters, yet many entire, & some large turbens that have a contrary turn.\* I suppose he will ere long give a full Account of it in the *Philosoph. Transact.* I cannot perswade my self but that these & the *Glossopetræ* & *Raiarum vertebræ*, & some fossill conchæ as the oysters you informed me of, & many echini shells I have seen, were the very spoils of the sea, & did once belong to living fishes. Other such figured bodies found in stone & spar must needs have a different originall, as your argumts evince & of this their originall your Hypothesis gives a plausible account. But after all we [may] be as much at a losse to find by what meanes the former were brought to the places where they are found lodged, as we now are for all. The Argument from ye Histories of conchæ found in the glands of Animals I must confesse doth not weigh much with me, because

\* *Trophon antiquus.*

they are but few, & may be accounted for some other way.

I received together with your Letter one from Mr. Willbraham, both inclosed in one from Mr. Walter Thomas, attended by a large Cheshire cheese, wch I understand by them is your gift though you mention it not, for wch I return you many thanks, the Cheese proving as good as it is great. I know not how to make you any amends, & therefore must remain your debter. I am Sr sincerely

Yours in all offices of love & service,  
J. R.

175. MS. *Eng. Hist.*, c. 11, f. 56v.

For Mr. EDWARD LHWYD at Scotch burgh near Tenby in Pembrokeshire, S. Wales.

( $\frac{M}{15}$ ) [1697]

Sr,

Matthew Hale his *Origination of mankind* I have seen, but could never find in my heart to read, not expecting any great matter from a man of his employ in subjects of that nature. However you derived not ye notion from him. I imagined Mr. Cole to have taken offence at something I wrote in my last Lrs to him; for I sent him two to wch he was not pleased to return Answers: but I perceive he reteins still some kindnesse for me, being so tender of my reputation. Tis true I have been much sleighted by Dr. Woodwd in his late *Invective agst my worthy friend Dr. Robinson* subscribed by Mr. Harris, & tacitly too in many places of his first book, to wch passages I thought once to have answered, but that I had other work upon my hands, & was loath to spend my time in that manner; but I find I need not. Dr. Arbuthnet hath sufficiently exposed his Hypothesis in generall, in a few words: and one Mr. Keill of Oxford is taking him &



Mr. Whiston & Dr. Burnet in hand, as Dr. Robinson informs me.\*

I am now about to send up my *Supplementum Historicæ Plantarum* to London in order to Printing: my Age & infirmities call aloud upon me to rid my hands of works of this nature. I am sensible it is nothing so perfect as I might have rendred it, had I had leisure or ability to spend some time at London & have viewed all the gardens thereabout, & to have described from the life all such new & non descript plants as I should have found there. Dr. Sloane's History of Jamaica plants,† wch he hath frankly contributed to my Work, is indeed a great treasure, he having very exactly described every species; it will make up a 3d part of the Supplement. He described all in English, so that I am at the pains of turning it into Latine. I had had also a rich treasure from Dr. Sherard‡ of above 1000 non descripts with his Adversaria & notes upon them, together with ye sight of the specimina themselves wch he intended to have digested according to my Method. But his being speedily hurried back again beyond seas to attend the young Marquesse of Tavestock, hath spoiled all so that my Book must want this considerable addition.

Iterum vale Amice integerrime.

To this letter, which is unsigned, are appended the following notes:

(b) About 8 years since some workmen at Dr. Richardson's in Y.sh. ridding a piece of ground, found upon breaking a great stone, a live Toad in the midst of it. The Dr. being present at ye very accident examin'd ye

\* John Keill wrote *An Examination of Dr. Burnet's Theory of the Earth, together with some remarks on Mr. Whiston's New Theory of the Earth*, Oxford, 1698. William Whiston (1667–1752) succeeded Newton as Professor of Mathematics at Cambridge. Thomas Burnet (1635–1715) was the author of *Telluris Theoria sacra* 1681. The controversy is described in Lyell's *Principles*, i, pp. 37–50.

† Sloane's *Natural History of Jamaica* was not published until after Ray's death, but he had the use of the MSS.

‡ Dr. Wm. Sherard had travelled with Lord Townshend on the grand tour, and had communicated his plants to Ray.

cavity where 'twas lodg'd ; and found ye stone to be of a very close compact Texture ; nor could he discover any visible meatus for Fluids &c. into it ; which without insisting on other Relations, proves sufficiently that animate Bodies may receive Birth & augmentation in solid stone. I take Dr. Woodward's account of ye Gravity of these Bodies to be a mere amusement ; & a confus'd notion, of no real use, & scarce intelligible to himself or others : and this is very manifest ; for when he names ye spec. of shell yt should be lowest or highest ; in chalk or stone &c. our observations contradict him, but when he talks of his Specific Gravity, we cannot agree upon ye Question.

(c) What origin soever we ascribe to ye strata ; the shells may very well be bedded in them, according to this Hypothesis. For Mr. Ray hath observed (& I can also confirm it) yt after a Glut of Rain the deepest caves drop : so that the Rain whilst it pervades the strata may be well allow'd to lodge these seeds therein. And 'tis farther remarkable that in all ye Quarries I have search'd, that afforded these Bodies, very fayr (commonly ye most beautiful) specimens adhered to the walls in the perpendicular Fissures, where the Rain water must glide ; as also on ye edges of ye Horizontal ones. A piece of a Sea Rock in ye Isle of Caldey, parting in a joynt (or one of these perpendicular Fissures), fell down and left an erect wall of about 40 foot height ; which I found close bestudded with a large sort of cockle stones for several yards. Now if we do not suppose them thus produced there ; what accident shall we think of, that might hang them on ye wall in that perpendicular posture. Nor is this (as I sayd before) any Rarity but so common that I can think of no shell-quarry that did not expect ye like phenomenon.

As for their being calcin'd &c. that (to speak with other fond Theorists) *is rather a confirmation than an objection* of this hypothesis in regard it maintains these bodies are corrupted in the earth as well as generated : and that from their dissolution divers minerals frequently



derive their Generation ; As spar, several sorts of pebles & the Astroites mention'd in ye Letter. As also [ ] vitriol since in some countreys these are inseparable companions of ye *Cornu Hammonis*, *Belemnitæ*, &c.

Nay for ought we know all ye minerals in nature may thus derive their origin partly from ye corruption of Animals & vegetables and partly from their seeds ; and as they are dissolv'd by subterraneous heats, Floods &c. the earth be supply'd by this kind of circulation. As for these fossil shells yt agree exactly with ye marine ones in Texture, weight, colour, & magnitude ; I answer yt when these seeds are deposited in chalk, marl, fine sand, & other soft matrices, such shells are produced ; but when they fall amongst limestone & other courser minerals they are less elegant & nothing so agreeable with ye marine ones. So yt from Oxford to Dover where we find much chalk & fine sand, we find these more conformable to ye marine ones & great variety of them ; but from Oxford to St. Davids, where there's no chalk at all, we find them courser & nearer aproaching to minerals and in most quarries lesse variety. (d) That shells are so seldom found in ye Glands is not to be wonder'd at : in regard these are not so openly exposed to receive their seeds, nor yet so agreeable to their proper matrix or Birthplace as ye Bowels of ye earth. Neither are all the Glands yt ever were examined anything considerable in comparison of ye Ground a man may search in one hour. I can think of no way but this that may solve that phenomenon ; and since 'tis a receiv'd opinion that ye other Insects found in animals are thus generated why should we hesitat at this ?

At this time Lhwyd in three letters to Lister refers to the despatch of papers to Ray by Dr. Robinson. On March 28, 1697, he wrote from Oxford:

“ I sent Wat Thomas last Fryday a Copy of my Papers, and have this post directed him to carry them to you. . . . When you have lookd it over be pleasd to communicat it to my honoured Friend Dr. Robinson, who will convey it to Mr. Ray.

I have not read over ye Copy ; presuming most of ye Faults of ye Transcriber are but literal. . . .”—(MS. *Lister* 36, no. xciv.)

Again from Cardigan on July 6, 1698, [*Addressed*] “For the Honoured Dr. MARTIN LISTER at ye Old Pallace Yard in Westminster. Leave this at Dr. Powel’s in Caermardhin.”

“ . . . Dr. Robinson will shew you (if he hath not already) a Copy of my Letter to Mr. Ray about some suspicions of the Origin of Marine Fossils and ye Coal Plants, together with Mr. Rays answer. When you have perusd it be pleasd to inform me, whether you think their being produc’d by such means utterly impossible. . . .”—(MS. *Lister* 36, no. cvii.)

And lastly from New Town, Montgomeryshire, Oct. 18, 1698: “ . . . I have lately sent Dr. Robinson my last Letter (which is to Mr. Ray) and the preface, together with a short Plain Inscription, instead of an Epistle Dedicatory ; which I neither could nor durst write in that applauding style so much in Fashion. . . .”—(MS. *Lister*, 36, no. cxiv.)

**204.** MS. *Eng. Hist.*, c. 11, f. 59.

For Mr. EDWARD LHWYD at Dol Gelhey in Merionethshire, Salop post, Montgomery bag.

( $\frac{FE}{7}$ )

B.N., Febr. 1, [16]98.

Dear Sr,

The beginning of Yr Letter of Jan. 21 is expressive of so much kindnesse & solicitude about my health & well-being that I must needs tell you, that I doe very gratefully resent it, & shall endeavour with sutable reciprocall affection to answer & compensate it. I am advised that Mr. Vernon had received one of your Catalogues\* for me, whether of Mr. Thomas or Dr. Robinson I know not, & that he hath put it in Mr. Edw. Bullock’s hand, a neighbour Gentleman & member of the house of Commons, who promised him either to deliver it to me wth his own hand, or send it by a sure messenger. But I have not as yet received it though I heard Mr. Bullock is come into ye Countrey. Such

\* The “Catalogue” was probably Lhwyd’s *Lithophylacii Britannici Ichnographia*, 1699.



persons usually forget or neglect their promises, & I fear I may want my Book longer then I am willing. But I should before this have acquainted you with my present state of health, wch is not very prosperous or comfortable, I being almost constantly afflicted with payn, wch though not intolerable yet sharp enough to discompose me & render me unfit for study in the day time, & to break my rest in the night very oft. I thank God I am not in a declining condition at present, but rather better & better. I have caused issues to be cut, one on each leg, in order to deriving the humer thither & drying up ye sores, but as yet I find little relief from them. Yet doe I not repent me of the making them, because if in the spring or summer time I can find meanes to dry up the ulcers on my legs, the humour wch otherwise might be driven inwards & endanger a sicknesse, may there find issue. I now return again to your book, wch I should have been glad to have seen for my own satisfaction, not out of any hopes to correct any thing either in ye matter or language. I am not so pressed with businesse, but I could willingly have served you in a greater affaire then that, setting aside other matters. The true reason, I conceive, why these Gentlemen were unwilling ye Copy should be sent to me, & wherein I concurre with them, was because what was duly weighed and considered by you needed not to be examined or censured by me, & that such a transmission to and fro would have been an uselesse expense of time & delaying of the edition.

You have so narrowly searched every corner of Wales for plants, that I wonder not you should make no considerable advance in these discoveries this last summer, but few having escaped your diligence. I doubt whether *Ireland* will answer expectation, because it hath been already searched by skilfull & industrious Herbarists as Dr. Sherard & others though I confesse those exoticks you mention found there, afford argumt to perswade that there are more growing there of the same nature, wch of what force it is, you will soon resolve us.

I thank you for the information concerning the manner how Bats affix themselves to ye roofs of caves & hang all winter, for although I have seen them there hanging in many places beyond seas, yet was I never so curious as to observe the manner how they suspend themselves. By what I find in your Letters & in the *Philosophick Transactions* of Dr. Richardson's discoveries & observations, I perceive him to be an extraordinary person, of great industry & deep insight into the more recondite History of Nature, & withall to have all the morall qualifications of a true Philosopher; some correspondence with whom, were I not now upon ye Pits brink, would be very desirable.\*

I am still upon my Supplement to ye *History of Plants*, the editions of new books, as Herman's *Paradisus Batavus* & Boccone's *Museo di Piante rare*, affording new matter & wch I know not when I shall come to an end of. I am also about publishing my *Methodus Plantarum reformatata*. I am sensible I want helps to make these pieces so perfect as I might have done; but I am not able to travell to visit Physick-gardens, & inspect the plants growing & in their state. I shall adde no more, but humble prayers that the Divine protection & blessing may attend you & forward your endeavours for ye advancement of Naturall History or the knowledge of the works of God & effects of his creative power, resting,

Sr, Your very affectionate friend & Svt,  
JOHN RAY.

214. MS. *Eng. Hist.*, c. 11, f. 60.

For Mr. EDWARD LHWYD at Jesus College in Oxford.

( $\frac{1A}{7}$ ) [1699]

Sr,

I very much approve the liberty you have taken to make use [of my] name, especially in so good company.

\* Dr. Richard Richardson (1663-1741) of N. Bierly, Yorks.



I should be very glad [to be in a]ny way instrumental in promoting your design ; but I am sorry [it] should be at the expence of so much time & pains in writing out ye whole Paper of Queries for me. The Plants you sent enclosed are very rare ones. The Bulb with a single flower, wch you had seen in seed before, if it be not a plant *sui generis*, but educible to any of ye known kinds, I think it may be referred to *Ornithogalum*. The small plant with a tuft of papilionaceous flowers seems to me to be a sort of *Anthyllis leguminosa*. The handed Orchis may be for ought I know my *Orchis pusilla alba odorata radice palmata*, but whether it had a white flower or sent of Musk I know not, & therefore can pronounce nothing of it. There is a plant like to a *Sanicula montana* or Cotyledon, wch hath a leaf resembling Your *Sedum serratum flore immaculato*. The circular Mushroom or Mosse is a very pretty kind, the like whereto I have not seen. I shall observe your directions in not communicating them.

I suppose you have seen Mr. Whiston's new theory,\* though you make no mention of it. It seems to me pretty odde & extravagant & is borrowed of Mr. Newton in great part. As for Dr. Woodward's dissolution it's enough to say that it is groundlesse & precarious. But yet it might easily be overthrown by observation & experiment. My neighbour Mr. Dale, of whom I doubt not but you have heard, hath observed at Harwich in this County in a cliff by ye Seaside, at least forty yards above the levell of ye shore a bed of shels of a foot & in some places  $\frac{1}{2}$  a yard or more thicknesse, the most of yt either broken into small fragments or mouldred to dust. Yet among them are a pretty many of bivalve & turbate shels of all sorts of different specifick gravities, & some of such rare forms as appear not now adays in our Seas. Many of a sort of large turbens wch turne the contrary way of wch he gave me some samples. This is matter of fact wch I leave to you to make deductions from. A more full & particular Acct of this

\* William Whiston, *A new theory of the earth*, 8<sup>vo</sup>, London, 1696.

bed of shels, wch He with another ingenious person hath made two journeys to view & observe, you may expect from ye sd Mr. Dale ere long in ye *Philosophick Transactions*. I doe not see how Agostino Scilla's observation published in ye *Philosophick Transactions* can accord with Dr. Woodward's Dissolution. I should be glad to learn what Hypotheses you have devised to solve these Phænomena. For my part the difficulties seem to me insuperable. To distinguish these bodies will not help ye matter at all. For if we grant some of them (which by the evidence of the thing we are constrained to doe) to have been real shels or fish-bones; it will be as difficult to give an account how they came to be lodged in the severall beds, mines & quarries where they are found as if we granted all. Proceed with courage & vigour, & Gods blessing prosper your endeavours. My glasse runs low, & I am attacqued with severall infirmities & distempers, ulcuscule upon my legs, freqnt Diarrhœas, & sometimes dangerous coughs, &c. so that I cannot reasonably hope or expect any long continuance of life. Something I must be doing so long as it pleases God I shall live heer. I have formerly told you what work I have in hand, a Supplement to my *History*; for wch I am desired by severall persons to publish figures. But I see it is altogether impracticable as Times & my particular circumstances are. I am

Sr, Your affectionate friend & Svt

JOHN RAY.

224. MS. *Eng. Hist.*, c. 11, f. 6.

For Mr. EDWARD LHWYD at Jesus College in Oxford.

( $\frac{MA}{1}$ )

BLACK NOTLEY, Aprill 30, 1701.

Sr,

I recd your very [ ] of Aprill 17 with much joy & satisfaction, not having heard fr[om you for] a



long time ; only by our common friend Dr. Robinson. I he[ar] n[ews] of yr motions & proceedings from time to time. I am glad that you are at last safely returned to yr Post at Oxford, but cannot think or hope that a person of your Abilities & improvements will be permitted to fix & settle for your lives time in so low a station. As long as it shall please God to continue life & any tolerable measure of health for me, I shall doe nothing more willingly then to maintain correspondence with so dear a friend.

Your directing the epistle you mention to me is so far from needing pardon that it merits thanks. I account it an honour to me that you have thereby published me as one of your friends. That you should have made a Collection of such bodies as is almost equall to those published in yr book is a thing that exceeds admiration. I suppose you are not ignorant that A Supplemt to my *History of Plants* is just beginning to be printed, & that you have seen the undertakers Proposals. They write me now, that they are resolved to goe on with it at their own risq, though subscriptions doe not come up to expectation. Dr. Sherard very friendly gives me all ye assistance he can. I believe in the collection of Plants he hath sent me there are not lesse then 1000 new & non-descript species, & besides he hath sent me notes & observations with Additions to & upon my whole *History*; so that he takes as much pains in the Work as if it were his own. The like doth Mr. Petiver, though a person much inferiour to the other both for parts & learning. He hath the greatest correspondence both in East & West Indies of any man in Europe ; I think I may say, then all *Europe* besides. Dr. Sloane hath also contributed greatly, viz. His whole History of non-descript Jamaica plants ; a Collection of Mariland Plants by Mr. Vernon & Dr. Krieg ; & a Collection of Plants from about the Magellane straits. From Father Camelli a Learned Jesuit, living in *Manilia* the Metropolis of ye Philippine Islands I have received 170 descriptions & figures of

Plants growing in those islands, with a promise of as many more of trees & shrubs but this I need not have told you, it being entred in ye Proposals. I have been so continually harassed with pain, & the weather hath been so unnaturally harsh & tedious to me, that I can doe but little. I hope every day for more mild & favourable, that I may proceed with more vigour, & be able to keep pace with the Presse.

Your samples of Irish Plants I should be glad to see, if you please to direct them to Mr. Smith in Pauls Churchyard at the Princes Arms he will take care to send them to me. I printed last year a small treatise intituled a *Persuasive to holy life*, a Copy of wch I intended you but knew not whither to send it. But now I know where you are I shall order you one shortly. I am,

Sr, Your very affectionate friend & servant,  
JOHN RAY.

227. MS. *Eng. Hist.*, c. 11, f. 64.

For Mr. EDWARD LHWYD at Jesus College in Oxford.

( $\frac{1V}{17}$ )

B.N., June 11, 1701.

Sr,

I received from Mr. Smith the parcell of Plants you sent, & soon after by Post your very friendly Letter, for both which I return you thanks. I have some queries to make concerning the Plants.

1. What sort of *Sanicula Alpina* it is that grows in the woods under thee mountain of Cruach inhii & by Kil Arni ?\* I am at some loss about it.
2. The plant you intitle *Erica S. Dabeoci* † I am in some doubt whether it be a genuine species of

\* *Saxifraga* or *S. umbrosa* L.

† *Dabeocia polifolia* D. Don.



*Erica*, the flower falling away, & ye fruit seeming to be different.

3. The *Adiantum verum* &c.\* seems to me to be different from the common one, & rather to agree with the *Bermudense* of Mr. Petiver.
4. The Plant you call *Alchimilla Alpina* 5-fol.† is it not the *Pentaphyllum seu potius Heptaphyllum argenteum flore muscoso* J.B. ?
5. The *Gentianella verna*‡ seems to me to be a distinct plant from *Gentianella quæ Hippion* J.B. & a nondescript though I cannot well discern the manner of the flower.
6. *Millefolium galericulatum minimum* whether it be different from the *minus*, as by its smallnesse it seems to be.§
7. The *Sanicula guttata* &c.|| seems to me a plant quite different from the common *Sanicula guttata*.
9. The *Sedum serratum foliis pediculis oblongis insidentibus* is it not the *Cotyledon altera olim Matthiolo* J.B. ?

My *Supplementum Histor. pl.* is not yet begun. The Booksellers tell me that they stay for a new font of Letter, wch the Printer promises them to get cast for it, & that soon after ye holydays they hoped to get it ready & that then they would push on with vigour. Dr. Sherard hath overwhelmed me with a multitude of Plants, wch I should be no way able rightly to intitle & dispose without his assistance. Another great contributor to this work is Mr. Petiver, a man of greater correspondence in Africa, India, & America then any one I know of besides. I am almost constantly afflicted with pain, yet something I make a shift to doe, & hope God granting life & some tolerable measure of ease, to keep pace with the Presse.

God continue to you the blessing that I want, &

\* *Adiantum Capillus Veneris* L.

† *Alchemilla alpina* L.

‡ *Gentiana verna* L.

§ *Utricularia minor* L.

|| *Saxifraga* sp.

succeed your studies & endeavours for the advancement of Learning. I am,

Sr, Your affectionate friend & svt,

JOHN RAY.

**228.** MS. *Eng. Hist.*, c. 11, f. 66.

For Mr. EDWARD LHWYD Keeper of the Ashmolean Museum at Jesus College in Oxford.

BLACK NOTLEY, Aug. 13, 1701.

Sr,

I received yrs of July 31st, & thank you for the information & light you have given me as to the Plants, wherein I acquiesce.

I am desired by my friend & neighbour Mr. Dale to acquaint you, that he should be very glad to hold some correspondence with you. He hath for some years last made Collections of formed stones, & observations concerning them.

He desires samples of the following species, or as many of them as you have & can spare, & he will requite you with such as he hath found in the Clifffes at & near Harwich, wch possibly may be new to you, at least they are not in yr Book.

Dr. Plots *Oxfordshire*.

Tab. 2. fig. 1, 4, 5, 6, 12.

3. fig. 1, 12, 13.

4. fig. 1, 2, 3, 4, 5, 6, 10, 12, 14.

5. fig. 3, 4, 6, 9, 13, 15.

6. fig. 8, 11.

7. fig. 2, 3, 4, 12.

8. fig. 11, 13.

I should be glad to see what observations Mr. Cole hath made about equivocall generation; but I see no reason why he should be angry with Mr. Doody & others for affirming what they saw with their eyes. When the fecundity of the seed of Misselto was by all generally denied, I look't upon it as a strange & unaccountable thing that nature should give seed to a plant in vain,



& therefore was prepared to believe Mr. Doody when he said he caused it to germinate, & brought witnesses to attest it. That some marine plants bear perfect seed I am convinced by autopsy, but whether this seed will germinate & produce a new plant I am not sure by experience, but doe firmly believe it.

I should be glad to hear that Mr. Bobart hath recovered his health again, to whom I pray give my respects. I am busy still in enriching my Supplement.\* I am very much obliged to Dr. Sherard for his large contributions, & the great assistance he hath given me. I am sadly afflicted with pain, wch renders me listlesse & indisposed to any businesse, & disables me with intention to prosecute any study.

It is some ease & comfort to me that my friends commiserate me, & so bear part of my burthen so far as in them lies, wch I know you doe : who that you may not experience the like troubles is the prayer of

Sr, Your affectionate friend & humble Svt,

JOHN RAY.

**256.** MS. *Eng. Hist.*, c. 11, f. 68.

For Mr. EDWARD LHWYD, Keeper of the Ashmolean Museum at his chamber in Jesus College, Oxford.

( $\frac{FE}{15}$ )

BLACK NOTLEY, Feb. 13, 1703.

Dear Sr,

You may justly wonder at my negligence in thus long defering to give you advice of the receipt of your most acceptable Letters, for wch I doe now though late returne you my most hearty thanks, only I am sorry that I should have given you so great a trouble at so inconvenient a season.

As to this delay, I have to plead in excuse my present

\* On Aug. 8, 1702, Tancred Robinson wrote to Lhwyd, “. . . Mr. Ray's new Method of Plants is coming over from Amsterdam where it is printed. His third volume of Plants is now actually printing here . . .” MS. *Ashmole* 1817a.

uneasy condition ; the sharp frost that happened last moneth, giving me a dire shock, & so aggravating the pains of my ulcers as to indispose me for businesse, & rendring me very slothfull, & unwilling so much as to take pen in hand.

I have read your Papers & greatly approve all. Only ye Beds of Oyster-shels\* wch are found in Kent, Surrey & other places doe a little stagger me, so that all their circumstances considered I can hardly shake off my former opinion, that these were originally Beds of living Oysters, breeding & feeding in the places where they are now found, wch were anciently ye bottome of the sea. I am also to seek about ye original of beds or strata of severall kinds observed in broken mountains. I cannot imagine whence they should proceed but from the sedimts of land-floods or inundations of the sea.

You have in my opinion effectually by unanswerable arguments overthrown Dr. Woodward's Hypothesis, & of all others who hold that these bodies were brought up from the sea & scattered upon the Earth by the Generall deluge. Whether are bivalves different in sex ?

You may well think me more at ease then I pretend to be, yt I can afford to write so much, but it is to you. I thank you for procuring the Papers to be sent Post-free. So much at present from,

Sr, Your very affectionate friend & servant,

JOHN RAY.

\* Probably *Ostrea bellovacina* and allied species.



## X.

THE LOST LETTERS OF RAY TO LISTER AND  
TO TANCRED ROBINSON.

1683–1704.

AMONG the Ray letters in the Botanical Department of the British Museum is a lengthy list of letters to and from Ray in the handwriting of Dr. Derham. It has generally been assumed that this document is an inventory of the letters contained in the collection with a brief abstract of each. It is, however, far more than this, for it mentions a large number of letters which have never been printed. All of these letters would appear to have been accessible to Derham when he was preparing his *Life of Ray*, and selecting material for *The Philosophical Letters of Ray*, but many have been lost, and Derham's manuscript abstract-inventory is now the only clue to their former existence. Unfortunately the writing is much contracted and illegible.

One letter addressed to Courthope and fifteen letters addressed to Martin Lister have been inserted in their proper chronological place in this volume on pp. 39 and 111–136, but the remaining three hundred and fifty to Dr. Tancred Robinson may be more conveniently kept separate. They provide us with accurate dates for many events, and are a monument to Ray's assiduity as a letter-writer.

Dr. Derham was a native of Worcestershire, born in

1657, who graduated at Trinity College, Oxford. In 1689 he was presented to the living of Upminster, in Essex, and became a Canon of Windsor in 1716. Some of his letters of considerable interest were printed in *The Essex Naturalist*, vol. xvii, in 1914. In one dated Feb. 3, 1704/5, he alludes to "the famous Mr. Ray" who "hath been dead near 3 weeks."\*

For his devoted work in honour of his fellow members of the Royal Society, Hooke and Ray, we cannot be sufficiently grateful.

1681.

Nov. 29. Books recd. *Syn[opsis]* with vertues. Cat[alogue] of Gen[era]. Dr. Morison no grammarian and full of errors.

1683.

July. Of ye Macreuse. Of Tournefort & ye Fr[ench] Herbarists. Queries sent to him beyond sea.

Nov. 5. Of ye Moss yt makes Cypres powder. Veget[able] Excresc[encies]. Scorpions. Qu. of Birds & Fishes.

1684.

June 16. *Hort[us] Malab[aricus]*. Breynius . . . rest<sup>d</sup>. in mer . wh. His design to write *Hist. Pl.* Whole Sevil Orange eaten cures agues. *Ficus indica*.

Aug. Macreuse. Wonders that at Rome they reckon it among fish more than other ducks. Woodcracker. Wife with 2 childr[en]. *Hist[tory of] Plants*.

Sept. 26. Mr. Banister. Wattes vain glorious. Where he lodges when in London. Desires to be plun . . . acqu[ire]d. Fossile shells.

Oct. To Dr. Sloane I suppose desire assist[ance] in Pl[ant]s.

Dec. Macreuse & Bernacles. Pl[an]ts. Mr. Charleton.

\* *Essex Naturalist*, xvii, 1914, p. 175. The editor has made a curious mistake in transcribing the postscript to this letter. "I met also with Ray's *Synops: methodica* . . . 'Tis in 8vo and never had any Irons," which the editor explains as polishing irons to take the grain out of morocco leather in book bindings. Of course Derham must have intended to write *Icons* or pictures, not Irons.



- Jan. Muntingius. 2 new Ferns. Lunaria. Icons to his *Hist. Pl.* Books. Mr. Hatton yt first put him on his *Hist. Pl.* Cicind[ela] male & fem[ale].
- Feb. Of Wheelers Travels. Turks possess X . . . . p Dr. Bernard. Lauremberg. Fishes that sing (?). Mr. Wil[lughby] Fishes he missed, supplied.
- Mar. 9. MS of Fishes sent. His *History Plantarum*. . . . . Murex.
- Mar. 13. Canada sugar from maple, etc. Cetac[ean] fish. Mr. Wil[lughby] Fish public[ation], scarce by his son but 16 y[ears] old. B[isho]p [of] Oxon undertakes it.
- Mar. 20. Dislikes Leewenh[oeks] opinion of . . . . Distrusts Bartholinus judg[ment] & sincer[ity]. Borelli. Whales. Dr. Brown's *Travels*. Other . . . .
- Mar. 24. Sends Baltner which Mr. Willughby purchased. Designs he & Sir Ph. Skippon have. Johnson unskilful. Of div[ision of] Fishes.

1685.

- Mar. 30. *Hist. Fishes* by R[oyal] S[ociety] undertaken. Not lately corresp[onded] with Lister. Of Fig[ures] of Fishes.
- Apr. 1. Lampetra of Dr. Plot. in Balt[ner] . . . Sugar from Maple expressed, but only 3i from gal[lon]. Letter from Mr. Cole of Shell-like stones & Purpura. Fungi semina in *Eph[emerides Medicophysicae] Germ[anicae]*.
- Apr. 9. Plot's Lampetra. Aldrovand . . . . of, being a cento from others with figures. Gesner most learned, far full[er] next him Clus[ius] & J. Bauhine. Of ye Reasons Dr. Tyson. Cicirellus. Maple sugar. Coles letter of Shells & Purpura.
- Apr. Orfus germanicus. Cicirellus ye sandeel. Dr. Sloane. Collins. Unicorn fish & Bartholine. Morison & Bobart. He undertakes on Mr. Ch. Hattons req[uesting] Dr. Morisons friend.
- Apr. Rudde. He & Mr. Wil[lughby] described most Animals they met with in Travels, but notes lost. Orfus. Cicirellus. Dr. Tel. Clus. *de Chym. Pl[ant analysi partiumque resolutarum usu]*. Dr. Covill.
- Apr. Orphus & Rotele. Wil[lughby's] papers in War[wickshire] not come at. Cicirellus.
- May. Reasons against transmutation of vegetable principles. Fishes. Against dried plants. Cuts to *Hist. Pl.* Fernes of Mr. Dodsworth.

May. Fishes in partic[ular]. Cutts.

May. Transmut[ation] Prin[ciples]. Grenobles Burning fount[ain] had no water. Greatest n[umbe]r of Descr. in *History of Plants* from book.

June. More of ye Grenoble Fount[ain]. Dr. Plot mistakes ye Lancast[rian] well yt fires a candle. A true acct. of it. Cicindela volans. Sea snail. Ag[reable] proposals for his *Hist. Plant.*

June. Geese. Reas[on]s against his boarding at Not[ley] (?).

July. Thanks him & Lister for carrying on ye wk. Johnston sent a fish.

July. Haddock. Butterfish. Sand eel. Glad which so goes on at Oxon.

July. Serge. No coit of Salmons. Lanius. *Hist. Plant.*

Aug. Bird of Thrush-kind. *Eph. Ger[manicae]*. Dr. Collins character.

Aug. Orbis Aegyp[tiacus]. Lugg. Fungi. Blitum etc. Errata in *H. Pl.*

Sept. Fishes. Orbis. Hist. owes much to Dr. Lister and him. Mr. Law[sōn]s n[on] descr[ipt] plants. Musæum ought to be Museum.

Sept. Bontius. Veg. substance on Hornbeam. Manna. Corrections of *Chym. Pl. Anal.* Schwenckfeld. *Hist. Pisc.*

Sept. Schwenckfeld. Refuses preferment. Dr. Tyson's papers.

Sept. 25. Swenckfeld. Watts.

Sept. Monoceros. Schwenckfeld. Aprove . orig[inal] of Fishes. Holyhock plaster.

Oct. Tuba marina. Mushrooms. Plates of Fishes. Ling. Faults in his *Hist. Pisc.*

Oct. Diarrhœa. Faith[orne] . . . . . with perfect[ing] ye Appen-  
d[ix]. Piso slighted. Boneto. Sea-snail.

Oct. Plants.

Oct. His med[icine] in his Diar[rhœa]. Physick a conjectural science. Hitting of distempers a gift and Dr. Lister happy in it.

Oct. 26. Diar[rhœa] stoped by Chalton. Suppl[emen]t to fishes. Noe dispatch, having no Amanuensis.

Nov. 6. Dedic[ation] of *Hi[storia] Pis[cium]*. Morison's w[or]k too great for him. Occasion of his undert[aking] ye *H[istoria] Pl[antarum]*. Leeuwenhoeck.

Nov. Correct[ion] of Dedic[ation].



- Nov. Additions to Fishes. Correct[ion] of Dedic[ation]. Balt-  
ner's figures. Trachiurus & Tunny.
- Dec. Botan[ical] Lexic[on]. Hieracium. 3 years in completing  
his 1st vol. of Pl[ants].
- Dec. 7. Names of Plants found. Trees. Coning-fish (?).
- Dec. Errata in Append. Divers fishes. Fishes common to  
Ind[ian] & Eur[opean] seas, contrary to Lister.
- Dec. Banana & other veget. What Logwood tree. Faithorne.  
Ichthyology near finished. *Lexic. Botan.*
- Jan. Copy for ye press. Mr. Dale assists in examining of  
names.
- Jan. Copy sent of Verticillates. End of Moschatellina. Faithorne.
- Jan. Correction of ye Plates of Fishes. Divis[ion] of his  
vol[ume] of *Hist[oria] Pl[antarum]*.
- Jan. Correct[ion] of Icons of Fishes.
- Jan. More corrections of ye *Ichthyology*. Plaster for scrophula.
- Feb. Add. Pl[ant]s.
- Feb. Index & errata sent.
- Feb. Add[itions] of Pl[ant]s.
- Feb. A plant or 2. Dale wrote to Motte about divid[ing] his  
*Herbal*.
- Mar. Coffee plant. Dendrology not think of yet. Listers  
undertaking ye Conchae.

1686.

- Apr. 7. A Legume. Moss. Divis[ion] of Trees. Of refer[ences]  
to figures.
- Apr. Astragalus, etc.
- Apr. Health. Of oblit[erating] what said of ye Dr. in pref[ace].  
Wellcome premised.
- Apr. [Royal] Soc[iety] presents him copies of *H[istoria] Pis[cium]*  
& disposes of them. Correction of *Viola martia*. Omissions  
in preface to the *Pl[ants]*. Index thereto. Dictionary of  
terms.
- May. Mr. Gale. Index to 1 Vol. *Cat[alogue] of Pl[ants]*  
omitted.
- May. *Cat. Pl.* omitted etc. Some to be added. Offers  
Faith[orne] .... for g. Pres[en]t ...
- May. Expectation of his comp[any]. Postages offered. Motte  
& Faith[orne].

- June. Thanks for comp . . . . Pretty Phaenom[enon] of Sp. V. & Ol. Tereb. Wants wds for undertakers, etc. Grasses. Plots *Staf[fordshire]*. Plates of *Pl. I.*
- June. Correct[ion] of mistake of ye Phaenom. Presents his *Hist. Plant.*
- June. Presents of books. Fires at work in *Staf[fordshire]* ye Dr's mistake. *Hort[us] Malab[aricus]*.
- July. Some Pl[ants] & seeds. Illness hindered his viewing ye Phyt. Gardens. Moderns advance Botany, but not so learned as Bauhines, Clusius, etc.
- Aug. Rely on Dr. Sl[oane] for description of n[on]des[cripts] in Chelsey. Of *Cat[alogue] of Pl[ants]*. Copy sent of Bulb. Correct ye Press.
- Aug. . . . . fabulous. Ambergrice not from Metle. Tulips etc. Indian trees.
- Sept. Interc[hange] of letters πολλὸς φιλίας ἀπροσυγορία διέλυσεν. Ambergris not exsudation of Metl. Pl[ant]s & Trees. Wife breeding.
- Oct. Divers Pl[ant]s. Tavernier fabulous (?)
- Oct. J. Bauhines transcribes.
- Nov. All spice Mr. Dale saith. . . . Drug[ists] send them for Carpobals[am]. Snake-wood like kind. No great new in C.I. . . Ricompletti. Distrib[ution] of trees.
- Dec. Graminfol. sent. . . . . to forreigners. Indian Synemas difficult. Qu. whether plums specifically different ?
- Dec. Some grasses. Writes to Herman.
- Jan. Corrections etc. of divers Pl.
- Jan. Of other Trees etc. to be [added]. Qu. the Arbor aq[ua] fundens as fiction.
- Jan. Hermans letter sent. Will send his first genus of trees.
- Feb. 14. Questions the truth of Drop Willows. Pitch & tar made of more trees than one. Copy of *Dendrol[ogia]* sent.
- Mr. Dales. Feb. 14 1686. Qu. what is Pix Burgund: & Terebinth. Motte & Faithorne.
- Feb. Of some vegetables.
- Mar. Trees for Herb[al]. Of ye Turpentine, Frankincense, Resins.
- Mar. More of Frankincense & Plants.



1687.

- Apr. Correct place of Pl[an]ts. Cat[alogue] of Pears, Apples etc.
- Apr. 4. Wife d[elivere]d yesterday of a girl & excuses him, Sr. Philip Skippon having long offered(?). Ash adv[ised] for Herpes.
- Mar. 21. Letter to Plukenett. Dale & Faithorne treat about a Pinax of Plants, which Mr. Ray takes not well, & will publish one. Walter will publish *Catalogue of English Plants*.
- Apr. 8. His herpes & pain cured by Holyhock leaves boiled in may-butter. Cat. of Fruits.
- Apr. Custard apple etc. Daughter baptised Catharine.
- Apr. Sorbus etc.
- May. Seeds. Thanks. Plants. Description of Pimp[inella] spinosa.
- May 25. Trees. Lotus described. Had gone thro his trees, & will methodise etc.
- June. Received letter, seeds etc. from Mr. Banister. Add vertues cost & lab[o]ur.
- June. Seeds received & plants of Mr. Banister ... of Phyl. pan. Other plants. Breaks.
- June. Prunus sylv[aticus] described. Cur[rant] grape a monstrous product, being without stones. Not stay for copy.
- July. More plants. Letter from Dr. Hulse. ....
- July. Plants, Corrections. Alg. opera in lungo fas est obrepere somnum.
- July. Pls. Shall finish in a month.
- Aug. Trees. Only Append & Siliqui & Anomalous remain.
- Aug. Vertues of Wine etc. in dead child. Hiccough, etc. Trees. Made lean by drink[ing] vinegar.
- Aug. Plants & Trees.
- Sept. 7. Comes to London.
- Sept. 7. Answer to Querys of plants & Ornith[ology]. Sr. Fr... suit with Sr. Jos Ch[ild] ended, & his annuity.
- Sept. 19. Thanks for Lond. visit(?). Querys of things he saw at Mr. Charletons & Fulham.
- Oct. Would do what he req[uests] but had time only for ye preface, table etc. Doody plants.
- Oct. Emendations. Index tedious.

Nov. Index will be perfect with all copy. Faith[orn]\* would have an Index Remed[iorum] but not time. Dr. Merret. Plants. Unlucky mist[ake] of printers in Quinquin.

Nov. 25. Thanks for his pains in his errata. Title J. R. *Hi[storia] Pl[antarum]* To . 2<sup>dus</sup> Dr. Rob[inson] undertakes ye *Index Remed[iorum]*.

Feb. Omis[sions] & faults etc. in his book written in haste. Rosmar[inum] syl[vestre] omitted. Copies his due etc.

## 1688.

Dec. 28. After coming renew corresp[ondence]. Wife near her time, & desires to be god father if a male. Cor[rection] need to ye others.

Jan. 14. *Method of Insects*. Made too bold with oathes.

Feb. 11. Yest[erday] wife d[elivere]d of a d[aughter]. Omissions in *Synopsis*.

Mar. *Synopsis* in press. Catalogue of Plants from Snowden. Would undertake Beasts and Fishes, Fossiles & Reptiles sent. Child baptised on . . . last.

Mar. 22. Would publish his *Synopsis* for profit, not want, if had his due, but not genius to be importunate. Omission in *Synopsis*. . . . . lend to Dale.

## 1689.

Mar. 25. Motte intends no recomp[ense] for his copy.

Aug. Cat. from Mr. Lloyd.

Aug. Congr. . . . safe return. Of his *Synopsis* not print amend[ations] etc. Dr. Sl[oane's] return. Of his *H[istoria] Pl[antarum]*.

Sept. Motte to ret[urn] copy if not print ye *Synopsis* & Mr. Ray will print at once and return ye 5*li*. Dr. Mulline proposed his going to Irel[and]. He named Mr. Lloyd. Dr. Sl. fittest. Sl[oane's] vast discov[eries]. *Allium sylvaticum* description for *Synopsis*.

Oct. Sl[oane's] disc[overies] to be advised. Commelins *Cat*. Sibbald's gr[osly]. . . . . but not . . . . Ray.

Nov. Had writ to Motte. Commelin errs in his Quot[ation] of his *Hist*. Bookes he wants.

\* Henry Faithorne, the publisher.



- Jan. Wonders at Motte. Hopes now to see it published. Dedic[ation] to Sir T. Wil[lughby]. Send old copy of his *Cat.* for plants. Hopes now to betake himself to own bus[iness] had so minded these stud[ies], but being hampered with Oates etc.
- Feb. Dr. Sloane visited. Done greatly for so short time, & so volatile a temp. Bind Motte. Nothing from Lloyd. What he intends by Addenda & emendenda. Child fits, teeth etc. Allen a citiz[en] new come.
- Feb. Childs fits. Hoped for some printed sheet of *Synopsis*. Dr. Sloane.
- Feb. Child man[age]d River[ius] way. Lloyd. Sherard.
- Mar. Cold & Feav[ou]r. Mottes design to suppress ye copy.
- Mar. 17. Much indisposed, & process with it. Motte. *Synopsis*.
- Mar. Better. Index done to P. Child another fit.

## 1690.

- Mar. Not find Index. Child fits. Allen practises after Riverius.
- Apr. Index. Alsine.
- Apr. Plants. Expects not from Dale. he reserves for his *Hist.* Speed[in]g get Preface, title etc. ready.
- Apr. Wants Fasteful. Dr. Sl[oane's] observations of plants common to Jamaica & England.\* Would finish ye Ep[istle] but for ye Fast.
- Apr. Elogy of Bobart must be. Omissions in *Synopsis*.
- May. Pres[ents] copies of *Synopsis*.† Loc[al] w[or]ds to div[ers] Prov[inces] in his ed[ition] of books. Snail that lays vast eggs, & egg or young one bigger than itself.
- May. Presents. Equis[etum] nud[um] used for polishing. Catalogue of N[orthern] words to be enlarged.
- May. What he dissents in from Mr. Doody. Very nice grammatical corrections. Thorn-apple not English plant. Cat. English words will send. Rec. Nat. Hist. of England for him to undertake.
- June. Intends to republish *Cat.* [of local] w[or]ds. Will not be too hasty in composing *Method. Hist. of Anim & Foss.* (Vast nrs. of them. Faithorn chased. Dr. Pluk[enet's] Abies.

\* Printed on p. 250 of the *Synopsis*, 1690.

† Ray, *Synopsis Methodica Stirpium Britannicarum* was published by Sam Smith in 1690, and bears an imprimatur dated 22 Jan. 1689. Ray's presentation copy to "Samuel Dale de Braintriam Essexiæ" is in the Botanical Department of the British Museum.

June. Can lodge singly 3. Of Abies.

Nov. Of writing to Commeline. Of print[ing] his *Cat. Words & metals* etc. Thinks of printing a spec[imen] of his Div[inity] from some common places 30 y[ears] agoe at Cambridge—of the Wisdom [of God] in Creation, because a Divine.

Oct. Hath sent Loc[al] wds. Sear from  $\xi\eta\rho\omega$  Add of defects of English Alphabet. Number of Papil. Di[urnal] & Noct[urnal]. Sir P. Wil[lughby] not publishing his *Pars Ins[ect]* now Dr. Man dead.

Dec. Books he will consult before he publishes *Wisdom [of God]*. Of ancient & mod[ern] learning during particular inst[ant]s. Banister's *Pistolochia*. Lr. to Commelin.

Jan. Boyle works less esteemed why . Bp. Wilkins vindicated against Wood.

Mar. Sends his Book. (I sup[pose] *Wisdom of God*)\* only for some books. Plants.

Mr. Dales. Mar. To solicit to reprint his *Method. Plant.*

Mar. Child fits. Lloyds letter. Perfume gloves. Plukenet.

Mar. 16. Remarks on Dr. Plukenet.

1691.

Mar. 25. Of Mosses. English words. Mosses if dry will open in water. Mr. Smith dealt kindly by present[ing] books etc.

May 6. Ret[urned] from Lond[on]. Jamaica pepper differs from Clus[ius]. Dr. Sloane's error about it. Tree in Bishop of London's garden Mossey.

May 13. Plants. Dr. Plukenet & his writing better in Latin than English. Herman takes no notice of him, nor Sibbalds. Defends his *Method*. Mr. Llhuyd's *Catal. of Stones*.

May 22. Dr. Pluke[net] not cleard ye *Serpentaria virginica*. Mr. Waller desired him to draw account of Pluk[enet's] *Phytographia*. Of excuses of Hast.

June 8. Mr. Lloyds *Stones* sent him : disapproves Hybridens names. Lizzards. *Urtica marina* zoophytes. Tiliassuppl to *Syn[opsis]*. More Insects than in his *Wisdom of God* & of other tribes. New division of Plants.

July 17. Childrens chin-cough.

July 24. Refuses preferment of Archbishop. *Dissolution of ye*  $\Theta$  (= earth) to be added from a Sermon at . . . . Insects far more numerous . . . . New Alga & its seeds. His circumstances.

\* Note by Derham.



- Aug. 3. Of *Wisdom of God*. Will send his sermon of *Dissolution*. Dislikes Burnets *Theory*, approves of Hook's. Cant attack Sir W. Temple.
- Aug. 25. Nothing in Zancus (?)
- Aug. 31. To Mr. Smith, thanks for *Dissolution* . . . . undertaken a subject to dis . . . . . that his mind may be free.
- Sept. 7. Qu. whether sea runs into ye Straits of Gibraltar. Qu. what opin[ion] of Master about ye obliquity of ye ecliptic. And additions to his last Tractate sent.
- Sept. 18. Thanks for information of De . . . . . ye Eq[ua]to[r] etc. Plastick no[tio]n & Nature. Smith desires a Disc[ourse] of ye Chaos. Kircher's *Arca Noe* trifeling & superficial. Lady-cow. You my right hand in all.
- Mr. Flamesteed Sept. 20. No alter[ation] of ye obliq[uity] of ye ecliptick.
- Sept. 30. Of Matter & Mo[ti]on, an effic[ien]t necessary to men & keep in mo[ti]on. Of mistake.
- Oct. 9. Had added ye descr[iption] of formed stones to ye *Deluge*.\* Mr. Sm[ith] would have a great deal, but unwilling for ye Purchasers sakes.
- Nov. 20. Springs [due] to Vap[ou]rs. Spring at Resebury in Yorksh[ire] not at ye top, but earth enough above for a Spring. Of Dropp[ing] trees.
- Robinson's letter dated Nov. 12, 1691, is printed in Ray's *Discourse on the Deluge*, p. 110.
- Dec. 7. Thanks for his add[ition] on ye burying old Rome. Center of ye Ocean ye center of ye  $\Theta$ s mo[ti]on & gravity too.
- Dec. 14. Drop-Tr. in Trees. He observed the effects of a Fog on one. Mist of \* in Cygnus.† Had been seriously chastised by an unknown hand for asserting Spont[aneous] Gen[erati]on, therefore hath enlarged on yt in his *Disc[ourse]* etc.
- Jan. 15. Insects some things. Fossil shells if asserted to be animal, had monstr[ous] conseyts, & if other, liable to ye Atheists obj[ection]. Mr. Boyls death.
- Feb. 1. Title to his Book. Accepts his Ad[ditions]. Cambr[idge] *Catal.* dear. An Eare of Ry in a child's side.

\* Ray, Three Physico-Theological Discourses concerning—I. The primitive Chaos and Creation of the World. II. The general Deluge. III. The Dissolution of the World and future Conflagration.

† Ray, *Discourses*, p. 113.

Feb. 17. Fish have urine bladders contrary to ye Fr[ench] Acad[emy]. Vipers have lungs & one ventr[icle] of ye heart. Cartilag[inous] fishes rise in water by taking in water. Thanks for correct[ing] his book. Sp. Turp[entine] & Sp. V: gave relief.

Feb. 24. Kircher's *Mund[us] subt[erraneus]* slite. Herbinus\* a better critick than Phil[osophy]r. Peyer† good, but he deseved himself. Dissertation of Fishes. Curr[en]ts of Gibralt[ar] streights. Dr. Hulse's Observ[ations] omitted.

Feb. 29. Treasures his Lrs. Con[cerning] his Cor[recting] of his Book. Not satisfied of ye Under current of Gibr[altar].‡

Mar. 3. Lr. from Mr. Fr. Rainf (ye A[rch] B[isho]p sends ye 20 Guin[eas]. Pectunculi[tes] that not appear, as Mr. Wil[lughby] & he found. Nautili entire not broken. Lamprey cannot rise nor Bullhead. Undercurrents. Lewenhoecks mistakes. Peyer [*Merycologia*].

1692.

Mar. 25. *Syn[opsis] of Quadrup.*§ refused. His *Method of Animals*. Title of *Wisd[om of God]*. Lr. of Mr. Elys about Dr. Sherlock's *Prin.*||

Mr. Dale's Qu. for Dr. Lister.

Mar. 30. *Method of Quadrup.* Dr. Sherlock's no[ti]on of *Prin.* Mr. Elys.

Apr. 5. Rhinocerot. Manati. Viper ovip[arous] as wel as Serp[en]ts. Charleton, *Onomast[icon]* a sorry book. Other Animals. Mosses. Herman if he undert[akes them] will outdo Dale. Weather unseasonable.

Apr. 13. Doubts about Quad[rupeds], Deer etc.

Apr. 15. Of divers Animals, Deer etc. Sprats cut Herrings etc. Gazelles.

Mr. Dales May 14 Q. of ye Officinals etc.¶

May 16. 4 July & 2 July. Snakes & Vipers eggs. Questions ye Mus Norweg[icus]. *Synops[is] Quadrup.* swells.

Mr. Dale of Officinals May 26.

\* J. Herbinus, *Dissertationis de admirandis mundi cataractis* . . . Amstel, 1678.

† Peyer, *Merycologia*: v. Ray's *Discourses*, p. 57.

‡ *Discourses*, p. 81.

§ Ray, *Synopsis Methodica Animalium, Quadrupedum et Serpentine generis*. Lond. 1693.

|| ? Dr. R. Sherlock, *Principles of the Holy Christian Religion*, 1662.

¶ S. Dale, *Pharmacologia*, 1693.



June 1. Bisules &c. & vipers Eggs. Adders vesic[ulæ] semin[ales].  
Frogs generacion.

Dale, Jun. 22. Of officinals. Salt petre.

July 8. Add to his *Disc[ourse]* 1. His progress in Insects. Mr. Allen\* caused ye Flying Glowworm to couple with ye creeping. His *Synops. Animal*.

July 27. Character of Dale. Dr. M's ill usage of him. Some plants. Dedic[ates] his *Hist.* to him. Insects weary him with multitudes.

Aug. 8. Perusing Dale's Book [*Pharmacologia*]. His ..... ing will ded[icate] his *Synopsis* to Mr. Burrell (formerly his pupil). Dale observd a small ad[ditional] moth.

Dale Aug. 29.

Aug. 8. Sept. Pieces of L[ette]rs about ye Earthquake [in Jamaica on June 7].

Oct. 12. His placing refer[ences]. Plates. Rauwolf work print[ing]. Mr. Charl[eton] & Dr. Sloane. Lapidēs Judaici. Had translated Tyson's *Rattlesnake*.†

Oct. 21 & 24. Add. to his *Disc[ourse]*. some p[ar]tic[ular]s of ye Earthquake. Charleton's *Onom[asticon]* a sorry book. Of Rauwolf printing. *Aper Moschiferens*.‡ Transl. of Tys[on] *Rattle Snake*. Had drawn up of ye *Being & Generacon of Animals*.

Oct. 26. Of Rauwolf.

Nov. 16. A good Observ[ation] in Charl[eton's] *Onom[asticon]* of Animals voices cf. Burnet's Orig. fancy. Of Rauwolf. His *Synops. Quadrup.* in wh. translation of Tys[on] *Aper Mosch.* etc.

Dec. 18. Of Drs. persist[ence] in his revis[ing] his forr[eign] *Catal.*§ but bound by oaths to his own faculty. Of Swines feet & Bisules etc. Dr. Plukenet's answers?

Dec. 30. Recd. Box of Insects well. Observ[ation] in dissecting ye Uterus of a Sow. Advice for Mrs. Drap[er].\*

Dale, Jan. 30. Of things relat[ing] to his book.

Jan. 16. Swine's Foetus. *Syn. Quadruped*.

Jan. 23. 5 Guineas for his *Synops. Animal*. Ma[teri]als for his *Catal[ogue]* of outland plants.§

\* Benjamin Allen of Braintree married Katherine da. of Dr. Joshua Draper.

† Tyson, E., *Vipera Caudisona americana, or the Anatomy of a Rattlesnake*, Phil. Trans. xiii, p. 25.

‡ Tyson, E., *Tajacu seu Aper Mexicanus Moschiferus, or the Anatomy of the Mexican Musk-Hog*. Phil. Trans. xiii, p. 359.

§ Ray, *Stirpium Europeanarum extra Britannias nascentium Sylloge*. London, 1694.

- Feb. 3. Ulcuscula in his legs. Catal[ogue] of exoticks, ye task he set him.
- Feb. 18. Ulcers. His Catal & ma[teri]als for it.
- Feb. 20. Same. Rauwolf.
- Mar. 1. Agost[ino] Scilla. Fossil shels. *Cat. forr[eign plants]*. Sores.
- Mar. 8. Sores. Scilla. Topical Catalogues. Weather cold & wet. Garden neglected.
- Mar. 10. Handsome compl[imen]t of his affect[ion]. Devoted his Books. But 3 Spec[ies] of Serpents engl only 1 were beyond sea. Mosses about his house. Mr. Dale offering an Amphisbæna. Dr. Sherrard's Catal. & his dissent.
- Mar. 17. Medic[ine] that eased best his sores. Correct[ion] of Rauwolf. Compositors spelling. He turns Dale's work into Latin etc.

1693.

- Dale Mar. 25. Sent his Dendrology. Is now upon Animals. Mr. Ray's assistance.
- Mar. 27. Pernios. Catalogues. Rauwolf & Breynius.
- Apr. 7. Pernios. Rauwolf's edit. Sr P. Wil[lughby] and Dr. Mans unkind[ness] etc. They have ..... several (?) Advers. of Insects to publ[ish] it. English Rivinus (?) & Swammerdam. Musskquash.
- Dale Apr. 10 & 12 Queries.
- Apr. 24. Muskquash wt. Squnck unkn[own] to him. The Possum ye Careguey. Catal. Bad Spring, & corn dear. Smith slow.
- Dale May 10.
- May 29. Glad to heer of his coming. Smith will publ[ish] his *Syn. Quad. & Serp.* by itself, & *Syn[opsis] Av[ium]et Pisc[ium]* distinct. Of *Synops. Insect.*, a difficulty.
- Dales June 8 & 1. Of salt of salt-peter. Desires him to transl[ate] ye Preface. Mr. Ray's Latin being too well known.
- July 10. Sores. Enlarg[es] his *Syn. Av. & Pisc.* Insects.
- Aug. 3. Sores. Catal. Dale's book & Dr. R. Preface acute.
- Aug. 8. Finished his Catal. His obs[ervations] of Fl. local. He will finish (with care) his job of journey-work ye *Genl. Synopsis Av. & Pisc.*



- Aug. 8. Drink waters. Catal. Will persev[ere] & dispatch with hast *Syn. Av. et Pisc.* not liking such things to be long in hand. No anatomical obs[ervations] which are in Willughby inserted.
- Sept. 6. Of Nieuhoff & du Tertre. His sores. *Synops. Av. et Pisc.* Griesley.
- Sept. 13. Sores. . . . . *Syn. Av.* Insects endless. Papilios the most observed. Martens [Spitzberg Voyage].
- Sept. 27. Had quite finished *Syn. An. & Quadr.* Of some Fishes. Reas[ons] on his sores.
- Oct. 3. Reas[ons] on his sores.
- Oct. 11. Of ye Coati. Cape fishes tales sing[ula]r.
- Oct. 17. Sores. [Dr. Robinson had prescribed an emplastrum ranis cum mercurio.]
- Nov. 29. Reas. on his Pernios. Fig[ure] of Snow.
- Feb. 21. Reason of less pain in sleep then awake.
- Feb. 28. Sent his copy of *Synopsis Av.* up this morn. *Catalogues for Cambden.\** Cambden's descript of na[tur]al things occasionally. Sent ye list, dedic[ation] & Pref[ace] to Catalogue.
- Mar. 14. Bent upon Add[itions] to Cambden for promise sake. What he supplied them with for Cornwall. Of Local Plants, instances of such.

1694.

- Apr. 11. Acc[oun]t of what is added in his *Syn. Av.* etc. more than in *Willughby*. Topical plants. Dr. Plukenets Filix's. Lichen.
- Apr. 24. Sores again. Errata in *Catal.* many. Of Figurs to his *Hist. Pl.*
- Sept. 7. Handsome excuse for entert[ainment]. Mr. Waller there. Mr. Paschal's acc[oun]t of Engl[ish] Manna.
- Oct. 17. Plumier. *Syn. Av.* Vernon's *Hist of Moths & Doodie's*. Lister's notion of Respir[ation] (in *De Cochleis*). [1685] opposed. He maintains ye aerial Pabulum largely. Air permeates nature.
- Dale Nov. 2. Of ye Bones of the foetus coming out of ye woman's navel.
- Nov. 28. His *Tract. of Respir[ation]* to be prefixed to his *Synopt. Av.* He adheres to his no[ti]on which he long had publicly maintained. Bovallis no[ti]on.

\* Ray, *Catalogue of Plants for each County*, publ. in Edw. Gibson's *Camden's Britannia*, 1695.

- Dec. 20. *Disc[ourse] of Respiration* sent. Qu. about ye blood of Hedgehog etc. Moyl's Fuci.\* Dr. Lister he thinks disturbed at his ravish[ing] ye discov[ery] of Spider's flight, & giv[ing] it [to] Dr. Hulse.
- Jan. 1. Amendacon in *Tract. of Respir[ation]*. Sent this morning *Syn. Stirp.*†
- Mar. 2. Delays in printing his copies excusable. Sr. T. Millington. Dr. Woodward premises (?) great.‡ Mr. Cole. Mr. Burscough's acc[oun]t of a Tromb.§

1695.

- Apr. 8. Send Burscoughs acct. Vertues to be kept as placed in *Syn.* Dr. Plukenet he dislikes. Mr. Lhwyd's letter censur. Dr. Woodward's Hypothesis.
- May 8. Rivinus *Epist[ola]* & his ans[wer] sent. Plants on coal from Mr. Lhwyd & Dr. Woodward. Arguments of not being real.
- June 24. What he is doing in Insects.
- June 30. Will answer Tournefort. Censures Dr. Woodward's Dissolution, Abyss of waters, etc.
- July 8. Tournefort. What he is doing in Insects. Author of Essay against Dr. Woodward.
- Jan. 21. Mr. Lhwyd's Lr. for Cornish intel[igence] sent. Not yet done with Tournefort. He would have done on those subjects, but to prove (?) every being seduced by him. He is about a *Suppl[emen]t* which he wrote of *Method* extorted by oppos[ition] & Reproach.
- Feb. 3. Mr. Lhwyd's *Syn[opsis] fossil[ium]*. Of his 3rd Tome. Not to be done without a year in London, which not. His Profus[ion] not to be . . . . negl[ecte]d. *De Resp[iratione]* will offend Dr. Lister. . . tends a small piece: 1. of the orig[ina]l progress of *Method*. 2. Acc[oun]t of his own. 3. Ans[wer] to] Tournefort's Obj[ection]s & obj[ection]s against his.
- Mar. 4. Of his *Supplement*. Mr. Tournefort charge agst him ans[were]d. *Syn. Av.* not publ[ishe]d.

\* Walter Moyle of Cornwall.

† Ray, *Stirpium Europeanarum extra Britannias nascentium Sylloge* . . . London, 1694.

‡ J. Woodward, *Essay toward a natural history of the Earth* . . . *Universal Deluge* 1695.

§ A water-spout. R. Burscough, of Totnes, wrote a preface to *Sanctification by Faith* in 1693.



Mar. 24. Object[ion]s largely against Dr. Woodward's *Essay* & haughty imposing his Hypoth[esis] of Origin of Springs. Monte de linia ye relat[ion] of its rise. Spent at Poppisham.

1696.

Mar. 27. Add[ition]s to Answer to Tournefort.

Apr. 4. Is about a new *Method. Plant.\** Is in pursuit of Insects.

Apr. 29. His reason of engaging in Phil[osophical] studies. Must draw up a *Methodus Plantarum*. Papilios. Hyaena & Badger. Mr. Wotton's memory. Malebranch saith Swammerdam demonstrated a passage of air thro ye Lungs to heart.

June 19. Dr. Sloane's Jam[aica] Cat[alogue] a w[or]k of inf[inite] pains. Plukenet's *Almag[æstum Botanicum]*. Whiston's Theory. Lr. & Oration from Hotton. Lister disturbed at ye denial of ye coldness of ye Hedghog's blood. His *Dissertation on Method* finishing.

July 8. Burnet charges Moses with a fable. Whiston more modest. He designed an acct of ye Script[ural] Hist[ory] of ye Creation, but laid it aside. Plukenet's *Alm.*, his Latin not good, nor composition of Greek names & mistakes.

Aug. 5. Dr. Plukenet's errours. Spelling 'Xanthos' with 'Z.' Dr. Connor. Prepar[ation] for Suppt. Mr. Doody fittest for it. Money had.

Sept. 17. Wishes Dr. Sl[oane] & Pluk[enet] friends. In what err. Pluknet unhappy in conjecturing & mistakes in latin. So in Dr. Lister. Connor out in his Hypoth[esis] about ye Grotto di Cane near Naples. His experiments there.

Dale Oct. 27. Malig[nan]t fever. Observ[ation] at Harwich.

Nov. 14. 2 letters from Ireland of cuts to his *Hist. Pl.* & of ppp. Dalisle.

Dec. 1. Of ye money old & new. Lays by ye thoughts of cuts. to his *H. Pl.*

Feb. 17. Supplt. A tempest at Wisbich in morn arrived at London abt 2.

Mar. 17. Capitation. Of ye Asteriæ. More dissatisfied with Dr. Woodward's Dissol[ution]. Tournefort's mistakes?

\* *De variis Plantarum Methodis dissertatio. brevis:*

- i. De methodi origine et progressu.
- ii. De notis generum characteristicis.
- iii. De methodo sua in specie.
- iv. De notis quas reprobat et regiciendas censet D. Tournefort.
- v. De methodo Tournefortiana. Lond., 1696.

## UNCERTAIN DATES.

Jan. . Thanks for Godfa[the]r. Sr. T. Will[ughby] will tread in his steps.

Additions from Schwenckfeld. Dedic[ation] of book. Mr. Ch. Hatton put him on *Hist. Pl.*

To Mr. Walford an acct. of what his Suplemt contains.

Jan. 13 by Postmark. Plants & preparing for his *Hist. Pl.* which Mr. Hatton put him on.

Correction of ye Tables of Fishes.

Rough draught of Preface to Fishes.

## 1697.

Apr. 12. Com upst[ai]rs & distress. Mr. Lhwyds stones etc. Dr. Sloane sent his papers etc. Dr. Woodwd deserve[s] chastisemt of his confid[ence]. Mr. Whiston. Pernios.

May 16. Self-conceit of Dr. Woodward, & a discourse . . . purpose, of emulation etc. Dr. Nicholson. Wonders Dr. Pluk[enet] refuses Sloane to shew ye dried specimens.

June 2. Nichols[on] 2d Confess. Dislikes Robinson's assert Spont[aneous] Gen[eration]. Toads in stone. Distrusts Buonani. Arg[umen]ts cog[en]t for Fossils being Sea-shells. Lister's Wotton of his prodig[ious] memory. Dr. Nicholson's praise.

June 16. Morison's book deare. Sores. Insects innumerable.

July 19. His Herpetes from Insects. Germ[an] D[octo]r that draws Insects. Insects endless. Dr. Preston.

Sept. 29. Ruysche's *Amsterd. Garden*.\*

Oct. 20. Styra. Copy of *Syn. Av.* instr[ucts] cate. Suppress his *de Respir.* lest [it] offend Dr. Lister, who [is] not courting of contradicting others. Sherard's Plants would much add to his *Sup[plement.] plant.*, but too long for his short life.

## 1698.

Apr. 1. Death of Daughter Mary. Sent ye copy of *Suppl[emen]t Hist. Pl[ants]*. Dr. Sher[ard's] Add[itions] quoted (?).

Apr. 13. Joys Drs. mar. *Suppl[emen]t*, what he expects for it & wherein imperfect.

\* F. Ruysch, *Horti Medici Amstelodamensis*, 1697.



- May 31. Reasons why Smith to have ye copy. Would have ye summe for it (viz. 30 *li* & 20 books bound) as Motte & Burrell gave for one of his other vol. Plain reas[on] for not print[ing] his *Syn. Av.*, but really want of money. The *Pl. reformata* near ready. German Dr. & Mr. Tournefort's esteem.
- July 6. Copy of *Suppl.* in Dr. Sl[oane's] hands ; committed it to him. Mr. Lhwyd's work. Dr. Allen prints 750 of his Min[eralogical ?] workes at own charge. Other twin Marg[are]t jaundise as her sister died.
- Aug. 10. Wants money. Herpes from insects.
- Aug. 17. Dr. Hottons packet. Letter from Rev. Camelli.
- Aug. 24. Hottons packet recd. Tentzelius's letter to him about his controversy with ye Col[legium Medicum] Gothanum. Wonders ye R[oyal S[ociety] do not answer him. Indignation at Keil's Book.\*
- Sept. 20. His sores. Printed his *Methodus* & reason of its imperfection. Smith. Answer to Tentzelius.
- Oct. 14. Answered Hotton's last. Sent Smith his *Method nov.* expects 5 *li*. Recd Rev. Camelli's designs.
- Nov. 11. Of print[ing] his *Suppt.* & *Method.* Herman's *Parad[isus] Batav[us]* eleg[an]t. Of Rhizophorus pl. Sores troublesome. Colbatch.
- Nov. 30. *Suppl.* & *Method.* Approves Colbatch's method in Ferns and ..... One cured of gout of 60 y[ears] by Tunbridge Waters.
- Jan. 12. Buckley's *Philos[ophy]*. Lhwyd's *Lithol[ogia] Brit[annica]* & acc[oun]t of it for R[oyal] S[ociety].
- Feb. 8. Rhizophora instances. Lhwyds *Lithophyl.* sent but not rec[eive]d.
- Feb. 17. Had but 5 *li* of Smith for his *Syn. Av.* Would have ye *De Respir.* returned be[cause] of Dr. Lister. Of deal with Smith & Walf[or]d for copies, & gett out of their hands what he would have Mr. Lhwyd done further in his *Lithophyl[acium]*.
- Mar. 1. Is deal[ing] positively with Smith. What is in his *Suppl[emen]t.* Lhwyd's *Lithop[hylacium]*. Mr. Vernon.
- Mar. 14. Smith's answer. He offered for 30 *li* & 20 Books. Faithorn gave 60 *li* for his *Hist.* when he less known. Smith lose their profit with ye book & to pay for it. What he had more done for ye *Supp[lemen]t.*

\* J. Keill, *An Examination of Dr. Burnet's Theory of the Earth, together with some remarks on Mr. Whiston's new Theory of the Earth.* Oxford, 1698.

1699.

- Apr. 5. Of print[ing] his *Suppl[ement]*. Of selling his copy of *Method. nov.* to Bentley.\*
- Apr. 18. Printing *Suppl[emen]t & Method.* Dr. Hotton's character.
- Apr. 26. Lr. to Hotton. Mariland Pl[an]ts [of Sloane].
- May 31. Chloris Gotthica. Smith backw[ar]d. *Method.* to be returned. Tournefort method dislikes. New characteristick of Genny's (?). Smith complies.
- Dr. Hotton's. June 8. To convey Mr. Ray's letter.
- June 28. Smith. Sores issues. Glad Lhwyd's *Lithoph[ylacium]* sent to Hotton, nothing too good for him, his commendation.
- July 12. Delivers Plants etc. Sores.
- Aug. 16. Letter to Hotton & Tentzelius. Smith & Walf[ord] delay. Young chirurg[ion] dresseth his sores.
- Oct. 21. Smith etc. bustle. Dr. Plukenet conserv. with Dr. Sloane & Petiver. Mistake.
- Nov. 15. Medic[ine] for sores.
- Jan. 3. *Suppl[emen]t.*
- Feb. 14. *Method[us] emendata.*†
- March 6. *Meth. em.* he may have. *Transactioneer* [a scurrilous pamphlet]. Plukenets deffen (?). Why Lister leaves of (?).

1700.

- Apr. 17. N[atu]ral Hist. decling. Fall out of R.S. Dr. Sherard will visit him. Had sent to London his *Perswasive to Holy Life.*‡
- May 8. *Transactioneer.* Oldenburg & Plot's *Trans[actions]* not better than Sloanes. Pluk[enet] & Petivers characters. Dr. Sherrard.
- Sept. 18. Parcel from Hotton & Camel. Dr. Sherrard bought . . . . . of Pl[an]ts. Presents him with *Perswasive to Holy Life.*
- Oct. 29. *Method Pl.* finished. Will add of Grasses.
- Nov. 6. Losses by Lhwyd's book. Feareth they will not print *Method. Pl.* Too much to impress on Hotton. Camelli's l[ette]r and Designs.
- Feb. 4. Heads in his vol[ume], to be extracted.

\* R. Bentley, bookseller of Covent Garden.

† Ray, *Methodus Plantarum emendata et aucta.* London, 1703.

‡ Printed by S. Smith and B. Walford.



Feb. 26. Hotton offers to print *Method*. Descript[ion] of Muscovy (?).

Mar. 5. Pain hinders his progress in Shera[rds] Cat. (?).

## 1701.

Mar. 26. Will send his *Meth.* for Holland. Of his *Suppl[emen]t*.\*

Apr. 23. Sends his *Method*. for Holl[and]. Smith will go on with *Supplement*. Hopes for it correct for ..... .

June 29. Sores a medic[ine]. Smith slow.

July 11. Smith dilatory. Sherard diligent, & fittest to com[men]t on Theophrastus.

Nov. 7. *Supplement*. Motte's† ability to correct. Hotton's care of this edition of his *Method*. His account of Waesburg's undert[aking] ye Edit[ion] of his *Syn. Av*.

Nov. 17. Millington advises for his sores. Dr. Hotton tells him ye Waesburgers, Printers, had undertaken his *Method*.

Nov. 21. Mr. Marsels vert. His *Method* will be finished in 3 weeks. Our book[seller]s. I treated with Waesburg to print *Syn. Av*.

## 1702.

May 13. About Icons L[or]d [Bishop of] London engages in it [*Hist. Plants*].

May 27. Lays aside thought of cuts.

Mar. 7. Progress of his *Method* in Holland. Of Supplement. His infirmities.

## 1703.

Apr. 7. Bp. [of] Lond[on] hearty in his Fig[ure]s, and laid aside not for want of money but supervise. Intent of prosecuting the *H. Insect*. *Wisd[om of God]* 4 edit.‡ intended. ....  
..... *Method: Anim.* said printed Impensis Smith a ly

May 5. Hotton's acct of Tournefort's *Instit*. Petiver fails. Flags in his *Hist. Insects*. Mr. Antrobus, ye most curious that ever coll[ecte]d Insects.

\* An advertisement sheet of "Proposals for printing by subscription a third and last volume of the General History of Plants by John Ray F.R.S. in folio," was published by the Undertakers, Sam Smith and Benjamin Walford in May 1701 and again in Feb. 1703. The text of the documents is published in full in the Term Catalogues, vol. iii, pp. 250, 343 and 396.

† B. Motte, printer.

‡ Possibly this should refer to the *Nomenclator Classicus, sive Dictionarium Trilingue*, of which the 4th edit. was printed by B. Motte for J. Taylor in Feb. 1703.

June 30. What he intends to do in *Hist. Insect.*

Aug. 4. First p[ar]t *Wisdom* sent him, & Smith desiring an advertisement, but loth to abuse ye Reader.

Oct. 6. Rec[eive]d Tournefort's *Coroll[arium]*. Of *Wisdom*. Advised by pious friends to leave off Insects, being alien from his profession, & spend in ppp.

Oct. 26. Recd. a book sent. Will draw up a *Method. Insect.* as a *Prodr[omus]*. What he intended of his *H. Insect.*

#### 1704.

Mar. 25. Two greivous illnesses like to carry him off. Add Dr. Plumiers Catal.\* to *Suppl[ement]*.

Apr. 15. Sr. T. Milling[ton] Antiscorbutic Diet-drink. Of fossil shells & wood from Mr. Lhwyd for his Phis. Pl. disc. Plumiers Cat. not to be gotten in Holland.

May 2. His Physick. Intends *Method. Insects*, & then to go on pian-piano.

May 28. Endeav[ou]rs to draw *Meth. Insect.* but at great loss for Genera of Flies. Mr. Morton & Mr. Dent could much assist. Mr. Dent here last Monday. About 50 Diurnal Papil[ios]. Noctur[na]l moths or Phalænæ inf.

June 7. Hears not of his *Suppl[emen]t* five.† Not satisfied with it. Of his reputation. Sent this ..... *Meth. Insect.* Thinks could make a greater progress in *Hist[ory] of Ins[ects]* than any man.

June 13. Lister's *Meth. Spid.* to his *Meth. Insect.*

July 15. Desires an observ. of ye Insect had in ye Dog-rose might be added to *Method. Ins.* Had begun his *Hist[ory] of Insect[s]*. Memory fails, but mind (?) remains.

Aug. 8. Had begun his *Hist. Insect.* His proposals for Sculpts.

Aug. 16. Further Proposals.

Aug. 29. Of manag[ing] his *Hist. Insect.*‡ Persons capable of assisting.

Mr. Ray died Jan. 17, 1704/5.

\* C. Plumier, *Nova Plantarum americanarum genera*, Paris, 1703.

† The *Historia Plantarum*, vol. 3, was published in June, 1704.

‡ Dr. Sloane suggested to Samuel Dale that he should finish this great work, but the latter replied that he was unequal to deal with the foreign species.



## XI.

## MISCELLANEOUS NOTES ON RAY.

The present collection of Ray's letters may appropriately be concluded by a few extracts from unpublished letters of several contemporary men of science, which shed interesting side-lights upon Ray's heroic struggle for life in which to complete his epoch-making *History of Plants*, and also upon the great difficulties of its production.

Under date, London, Mar. 25, 1701, ROBINSON wrote to Dr. LISTER at Mr. Mitchell's house in Leatherhead Surrey.

" . . . Proposals are printing for Mr. Rays 3d and last volume of Plants; I question whether they will get 200 subscribers."—(MS. *Lister* 37, no. 10.)

Under date, London, May 9, 1702: "For Dr. LISTER at his house in Leather-head Surrey."

" . . . Mr. Ray writes that his *Ulcuscula* spread more and more down his leggs, besides an *Incontinentia Urinæ et Fæcum Alvi*." (MS. *Lister* 37, no. 21.)

And from London on May 23, 1702:

" . . . Some Gentlemen have made proposals to Mr. Ray to have his three volumes of Plants all drawn and engrav'd, and that the Bishop of London hath promis'd to get a large contribution from the Queen for carrying on this design. I have sent him my opinion in this matter, for he is much bent upon it tho at Death's door. People think t's nothing to get 2000 fol. Plates ready in 2 or 3 years, where there are no Artists, nor any diligent skilfull eyes to direct and attend the Workmen if they were to be had. They propound 1500*li* by subscription and the Queens

Bounty, but I tell them they know not what they do for mony will come heavily at this juncture, and three times that sum would not carry it on, no not at Paris itself. . . .”—(MS. *Lister* 37, no. 22.)

“ . . . I hear nothing of Mr. Ray’s *Supplement*,\* which I am afayd Smith & Walford will be very slow in undertaking ; nor of his *Methodus nova reformata*, which, Dr. Sherard told me long since, was a printing in Holland. . . .”—(LHWYD to RICHARDSON, Oxford, July 17, 1702.)

“ . . . Mr. Ray is within three months compleating (by the help of the incomparable Dr. Sherard) his third volume of his *Historia Generalis Plantarum*, which will be very fine. His *Methodus* is now allmost printed at the Hague, by Dr. Hotton’s means. . . .”—(WM. VERNON to RICHARDSON, London, 12 February, 1702/3.)

“ . . . I likewise waited on Mr. Ray, who is very old and infirm in body, tho’ his parts are very vivid. There’s new cutts and Icons coming forth to all his three volumes, the Queen being at the most considerable charge. His *Methodus Plantarum* is printed off at the Hague, tho’ I have not seen it yet. . . .”—(W. VERNON to Dr. RICHARDSON, Peterhouse, January 20, 1704.)

“ . . . I hope to go thro’ them [the mosses] as fast as Mr. Ray’s *Supplement* is printed, whereof twenty sheets are done, besides the *Dendrology*. He designs a *History of English Insects*, with such as are found in the cabinets of our Virtuosi : I wish he may live to finish it. . . . Mr. Ray’s *Methodus emendata et aucta* is come from Holland. . . .”—(Dr. W. SHERARD to Dr. RICHARDSON, Westminster, March 25, 1704.)

“ . . . I told you I had not heard from Mr. Ray for some months ; since then I am told by Mr. Smith and Mr. Walford† that he hath been upon the point of death severall times this winter, but that now he begins to grow a little better. I wonder

\* The *Historiæ Plantarum tomus tertio, qui est Supplementum* appeared two years after. The *Methodus Plantarum reformata et aucta* was published at Leyden in 1703 under the care of Dr. Hotton.

† Samuel Smith and Benjamin Walford were the printers to the Royal Society at the Prince’s Arms, in St. Paul’s Church-yard, who acted as “undertakers” or publishers for Ray, and on March 26, 1701, put out a printed prospectus entitled “Proposals for printing by Subscription the third and last volume of *The General History of Plants*.”



they should conceal it from me so long. . . .”—(TANCRED ROBINSON to EDWARD LHWYD, London, Lady day, 1704.) (MS. *Ashmole*, 1817a.)

## POSTHUMOUS NOTES.

From THOMAS SMITH to LISTER. Dated London: Deane-Street-Soho. 21 June 1707.

[*Addressed*] “For my worthy Friend, Dr. Lister, at his house in Epsome Surrey.”

“ . . . I wondered, when I read over Mr. Addison’s *travells*, that hee tooke no notice of Mr. Rayes description of the *little Republic of St. Marin*, and that hee values himselfe, as if the discovery were wholly new, and owing to him. Hee had done wel, if hee had carryed Mr. Rayes booke along with him: which I bought upon its publication, upon Mr. Boyles recommendation, who gave mee the first notice of it.”—(MS. *Lister* 37, no. 45.)

From TANCRED ROBINSON to LISTER. Dated London, Sept. 25, 1708.

[*Addressed*] “For Dr. LISTER at his house in Epsom Surrey.”

“ . . . Mr. Ray’s Papers upon insects are given to the Royall Society in order to be printed, at present they lye in Dr. Sloans hands, and when they will see a Resurrection I cannot divine. Mr. Antrobus his Observations upon English Insects are laid aside. Mr. Pettiver is about finishing his second Volume of *Decad. Mus. Pettiver*, etc. in folio.

“Mr. Buddle of Grays Inn has drawn up his observations upon English plants, which are ready for the press in 4to, and will be a great improvement of Mr. Ray’s *Synopsis*.”—(MS. *Lister* 37, no. 58.)

From H. ASTON to presumably LISTER. Dated Whitehall, July 18, 1709.

“ . . . Mr. Ray’s posthumous Insects having been some time in Dr. Slones hands, I made a motion last Wednesday that the book might be printed presently as it is, without endeavouring to make it more perfect (as some pretended) or staying till figures could be got, a Committee was ordered to meet this Friday, to consider how it may be done, Dr. Slone says there will be 80 sheets of paper which I cant beleave, but the more the better. The effect of the meeting Ile tell you next time I see you, for Dr. Robinson and I will be there.

“I am your assured friend and humble servant, H. ASTON.”  
(MS. *Lister* 37, no. 73.)

From TANCRED ROBINSON to LISTER. Dated London, Aug. 6, 1709.

[*Addressed*] "For Dr. LISTER at his house near the Church in Epsom Surry."

" . . . With much Labour we have got at last Mr. Ray's posthumous piece de Insectis (præsertim Britan.) out of Dr. Slones hand, which may make about 40 sheets in 4to. Part of it is perfect, the other only Fragments. We hope to get it into the Press out of hand."—(MS. *Lister* 37, no. 74.)

That Ray interested himself in the affairs of the inhabitants of his village is proved by the draft of two deeds in his handwriting relating to a sale of cows. The manuscript, which is undated, is preserved in the autograph collection in the Botanical Department of the British Museum.

Know all men by these presents that I J. K. of B[lack] N[otley] in ye County of Essex, husbandman for & in consideration of 10 *li* to me in hand pd. have bargained & sold to El. T. widow of B.N. aforesaid, my 3 cows now being upon the land I hire of S. R. called Bradleys that is to say one old brinded cow & two young Cows, or Heifers, the one black & the other a red & one curled, with full power to drive away, sell & dispose of the said cows at her pleasure In witnesse etc.

Know etc that I E. T. for divers good causes and considerations me thereunto moving have given & granted & do by these presents give & grant unto J. K. the use and whole profit of the 3 cows I bought of him till Michaelmas next and after Michaelmas the whole profit of the 2 young cows for the sum of two full years the next ensuing and fully to be compleat & ended, he maintaining the said cows with sufficient pasture & fodder during all ye said term.

In witnesse etc.



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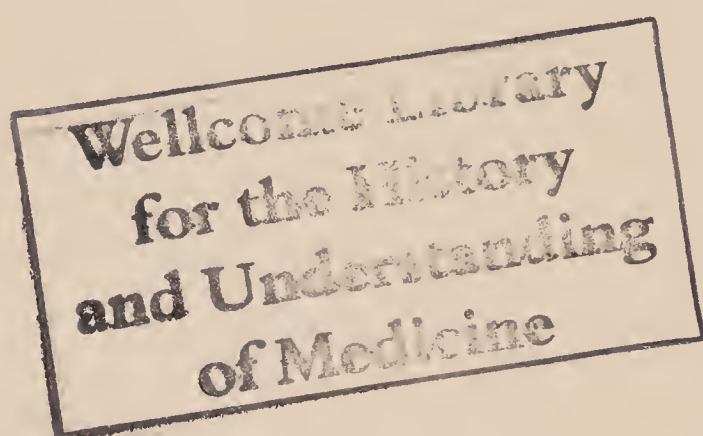
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